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January 31st, 1953

Engine Cooling by Ebullition

By O. B. FREEMAN
Tide Water Associated Oil Company
Ventura, California

Low temperature engine cooling

Throughout the years of combustion engine operation, conventional cooling has been of the low temperature direct heat transfer type. Another way of describing it would be to call it liquid phase cooling below the boiling point.

With this method, water is pumped through the engine, picking up waste heat which has not been dissipated through radiation, or has not been carried away in the exhaust gases.

The water then passes to a radiator or cooling tower where the heat is dissipated. It then returns to the suction of the water pump, completing the cycle.

High temperature direct heat transfer cooling

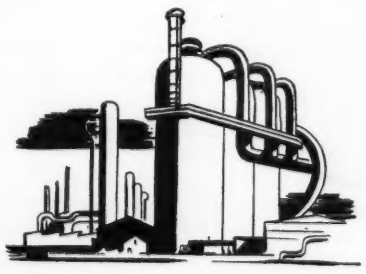
Some years past, a second method of engine cooling came into rather limited use. This method is a direct interfacial heat transfer in liquid phase cooling above the boiling point. In so far as the engine is concerned, this system differs from the previously described one only in temperature elevation. It uses the same pump, circulating a similar amount of water with the same heat pick up and similar rise in coolant water temperatures.

The water, on leaving the engine, passes to a steam separator. Here a drop in pressure allows part of the water to flash to steam, thereby dissipating the heat picked up in the engine jackets. The remaining water leaves through the bottom of this separator and returns to the engine, completing the cycle. The steam escapes through the top of the separator and may be used for useful work or, if not needed, passes through a condenser. In either case, the condensate gravitates or is pumped back into the engine cooling system.

Undesirable features of direct heat transfer cooling

Both the above cooling methods have inherent weaknesses. With radiator or tower cooling, you are always below the dew point, with its attendant formation of water sludge, and acids in the crank case; also overheating at high ambient temperatures and high load conditions. Both are subject to pump and packing failure. Engines using either system have a tendency to detonate and lose power if temperatures are elevated much above the design temperatures.

Due to lack of turbulence in the jacket water, we have a high temperature differential along the cylinder axis. This produces a decided taper to the cylinder when hot. Also due to lack of turbulence, the water tends to stratify with a very hot layer of water next the liner and much cooler water near the outer jacket. The result of this stratification is a heated liner trying to expand against a cooler jacket trying to maintain its original shape.



These forces acting against each other produce high metal stresses and result in warping and distortion of the cylinder top.

Furthermore, with direct interfacial heat transfer, the transfer of heat from metal to water is very slow, resulting in high metal temperatures. Bad scale conditions within the cylinder jackets may cause these temperatures to reach serious elevations.

Cooling by boiling heat transfer

For the past several years, I have been of the opinion that the proper method of cooling heavy duty combustion engines was by ebullition, or boiling, within the jackets.

In exploring the possibilities of this type of cooling and in studying the problems involved, it was discovered that the water should enter the engine jackets at a very slow rate and that the use of mechanical energy or pumps was not desirable.

From this discovery was born the second or twin idea that coolant circulation must be by thermal energy only. These two ideas are: 1. The latent heat of evaporation with its tremendous powers of cooling; 2. The simplicity and positive action of thermal circulation are the basis of our experiments and development of cooling by ebullition.

Laboratory tests have shown heat transfer under boiling to vary from 5,000 to 33,000 Btu/min. per sq. ft. This is many times faster than by direct interfacial heat transfer, and

explains why we can elevate our coolant temperatures without any significant increase in wall temperature.

Later in our investigations, we found that in a compressor engine operating with low temperature direct heat transfer cooling, with water pump functioning normally, we were unable to get steam bubbles to originate under any condition of loading and temperature, in either jackets or head.

This might be due in part to the thin film of superheated water being washed off the liner interface by high velocity water passing through the jackets.

Due to the low attraction of iron for water, the amount of super heating is low, being in the range of seventeen to twenty-seven degrees. This temperature elevation, however, is essential to overcome interfacial attraction and permit initiation, growth, and separation of the steam bubble from the metal.

In the same compressor engine and starting up cold without water pump, steam bubbles were observed on the liner walls when mean discharge temperature from the engine was under 140°F. Established boiling occurred at mean discharge temperature of slightly above 150°F. This indicated a definite time element or water velocity through the engine if boiling is to be achieved.

As a result of this set of studies, we are of the opinion that no boiling will occur at any place in a cylinder jacket so long as a water pump is functioning properly. The above refers to modern engines only.

In our older machines where little effort was made toward streamlining and low temperature rise, steam pockets could, and no doubt, did occur.

In high temperature direct transfer cooling, a decrease in temperature rise to as much as 6°F is frequently obtained. This is usually thought to be a result of boiling within the entire engine jackets. Again, such thinking is basically unsound.

If an engine has a normal temperature rise of 10°F and a rise of 6° with high temperature transfer, it would mean that the coolant was entering the engine at 6° below boiling point at existing pressure.

To start boiling, a sufficient volume of heat must be picked up by direct heat transfer to bring the coolant to boiling point; in this case 60% of total available heat. The remaining heat pick up will be through boiling transfer.

Since much less than 60% of engine jacket water heat comes from the cylinder walls, all heat transfer in cylinder jacket will be direct heat transfer and temperature rise along cylinder axis will be less than 6°F. Remainder of heat will be picked up in head and exhaust manifold. Cooling in head should be by both direct transfer and boiling. Cooling of exhaust manifold will be by boiling only.

Cooling by boiling heat transfer should produce a very low temperature rise across the engine, provided the plumbing system is designed with the idea of minimum heat loss through radiation. If this is done, coolant water is returned to the engine at a point so near the boiling temperature that agitation of a pump impellor would cause cavitation within the pump, and will result in severe damage to the engine. From this we again find that mechanical energy is absolutely out of the question by ebullition. A further study of physical reactions within the jackets rules out possibility of thermo-syphon circulation.

Thermo-syphon circulation is a function of the difference in weight of two legs. That being the case, the application of this principle to engine cooling calls for a pressure drop across the engine of very nearly a straight line.

With cooling by boiling, this is impossible. The origination, growth and movement of steam bubbles produce a partial vacuum. As a result, pressures are lowered in the cylinder jacket and in the bottom of the cylinder head. A decided build up in pressures will occur at the top of the head due to steam backing up in trying to escape from the head through restricted openings. Upon leaving the head, there should be an abrupt pressure drop. If a water cooled exhaust manifold is used, this rise and fall in pressure will be repeated by the steam in leaving the manifold.

Having eliminated mechanical energy and thermo-syphon for coolant circulation, we have left thermal energy only. And this energy must be produced within the body of the engine itself.

Applying laws of water tube boilers to engine coolant circulation

In our search for an application of thermal laws that would guarantee, through thermal energy, a sufficient or surplus quantity of water to cool an engine using latent heat of evaporation, we turned to the study of water tube boilers. In the single drum water tube boiler we found a condition we could very easily simulate in our engines.

In this boiler, steam is generated in a set of sloping tubes or legs, installed within a fire box. In the generation and passage of steam up through these tubes, water is picked up and carried along in large quantities. At the top of these sloping tubes, horizontal lines carry steam and water to a drum. The large quantity of water necessitates installation of baffles in the drum in order to secure separation of water and steam. Steam escapes through the top of the drum and the water drops from the drum bottom through a second set of vertical tubes or legs to bottom of the first or sloping legs, completing the cycle.

If you will visualize the engine water jackets as the sloping tubes, the firing chamber of the cylinders as the fire box of the boiler, you need only add a steam separator with enlarged line from the top of the engine to the separator, and a second leg from the bottom of the separator to the engine water inlet and the picture is complete. You have turned your engine into almost an ideal water tube boiler insofar as circulation is concerned.

Since one purpose of this type of operation is recovery of waste heat from the engine, you may wish to install a water cooled exhaust manifold and exhaust gas waste heat recovery unit. The question then arises, will we be able to circulate sufficient water to care for all this heat.

Since the steam separator is installed above the engine, the jackets plus the vertical section of the discharge line becomes the lighter fluid leg. The line from the bottom of the separator to the engine then becomes the heavier or solid water leg. You now have a condition in which circulation becomes a function of the difference in density of the two legs.

The velocity may be measured

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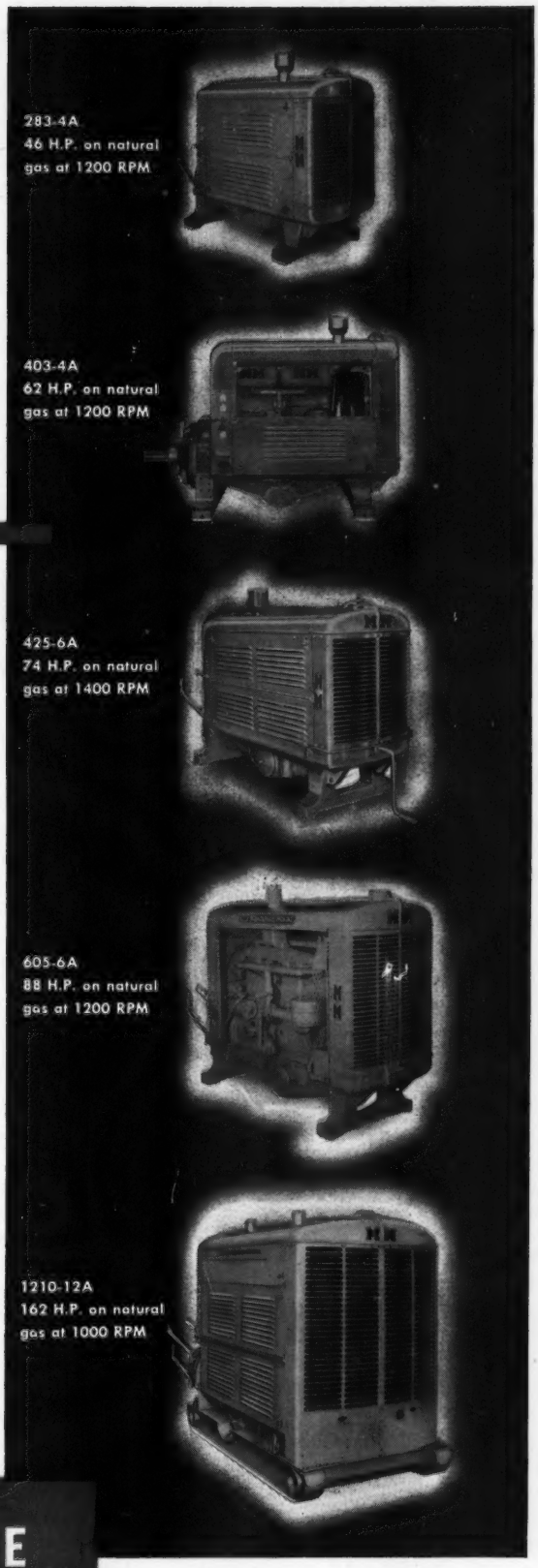
283-4A
46 H.P. on natural gas at 1200 RPM
403-4A
62 H.P. on natural gas at 1200 RPM
425-6A
74 H.P. on natural gas at 1400 RPM
605-6A
88 H.P. on natural gas at 1200 RPM
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using the Torricellian formula, $V=V\sqrt{2Gh}$, or for ordinary calculations, $V=8V\sqrt{h}$, h being measured in terms of the lighter fluid, in this case, steam.

Using the above rule, circulation may be calculated fairly accurately, provided no bad obstructions are allowed in the circulatory system.

These calculations show a very large surplus of water carried over at low engine loadings. As the loading increases, the water carry-over decreases in almost direct ratio. Later on in our work we proved the above under actual working conditions.

On a 150 BHP, 4 cylinder, 4 cycle compressor engine, using boiling heat transfer cooling, an orifice meter was installed on the solid water leg. Condensate was measured through another meter, as it returned to the engine from the condenser.

At 25% load, each pound of steam leaving the engine carried with it, 85 pounds of water. At 100% load, each pound of steam carried 18 pounds of water, while at the maximum loading of 117%, 13 pounds of water was carried out by each pound of steam. Better streamlining of the engine jackets would increase the amount of water circulated per pound of steam at all conditions of loading.

The above figures parallel surprisingly close the circulation, percentage wise, in a water tube boiler. It also shows the impossibility of insufficient cooling water being brought into the engine at any loading.

After much study and paper work we came to the conclusion that cooling by ebullition was both feasible and practical.

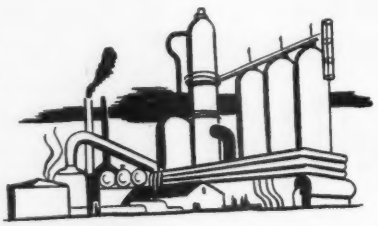
Actual Field Tests

On the strength of the above conclusions, it was decided to go ahead with actual tests. Mr. R. P. Bland, of our company, was placed in charge of running tests and correlation of observed results.

It was decided at this time that any engine under tests would be expected to hold up its end of the regular job at all times. The job being that of producing oil. If at any time an over-load was required, it would be applied. That rule has been consistently followed.

A six cylinder, 605 cu. in., 4 cycle engine, pulling a Kobe Triplex pump was selected as the guinea pig. This engine operates normally on the A.P.I. curve with a piston speed of 1000 ft. per minute.

A Vapor Phase unit, or steam separator, was borrowed from Engineering Controls, Inc., of Los Angeles. This unit was installed so it could be raised and lowered. This enabled us to vary the heads on both legs. At various points in the cooling system where changes of pressure might occur, holes were drilled and tapped. Cocks were installed so pressure readings could be taken.



Since temperatures above the boiling point become a function of pressure, no thermometer wells were installed other than in intake and discharge lines. Temperatures within the jackets were obtained from the steam table. To insure greater accuracy, mercury manometers were used instead of spring pressure gauges; pyrex nipples were installed on intake and discharge lines.

A series of studies were then started, using the engine pump to circulate the coolant. Curves showing pressure drops throughout the system were developed under various heads, volumes and velocity conditions.

On November 28, 1951, the water pump was by-passed. The engine was then put back in operation under normal working conditions.

Studies of this machine were continued over a total period of several months. Curves were plotted under many conditions. At one time, by use of an oil barrel for a reservoir, a minus zero intake head was achieved. At another time the engine was operated for three days, pulling a 40 BHP load while using a one quarter inch copper tube for a water intake line.

During this time, we were able to get a temperature rise of coolant across the engine of 1°F. First thought might be that in converting water at 212° into steam, there is no temperature rise, so rise across the engine should be zero. This thought would rule out radiation and would be perfection.

Perfection has never yet been achieved so we are satisfied with a 1° rise. However, on a similar engine but using an improved piping system, we were able, at a later date, to get a temperature rise of less than ½°F.

This low temperature rise was obtained only when the cooling system was properly designed. Proper design is simple.

It means placing the steam separator as near the engine as possible. Entrance into the separator should be approximately on a level with engine coolant outlet. An ample line should connect them to prevent unnecessary pressure build up within the engine jackets. A small water line from the separator to the bottom of the engine is essential. Return condensate to steam line leaving engine instead of to water line entering engine.

The small line from separator to engine will reduce radiation losses and temperature rise across the engine.

Since the condensate may return quite cool, admitting it on intake side of engine would tend to cool the entering jacket water and create increased rise across the engine.

The condensate, if admitted to the steam and water line leaving the engine, will pick up heat from the steam without affecting temperature of the mixture.

Eventually we felt we had sufficient working proof of the soundness of this type of cooling, to warrant installation on heavier equipment.

Compressor engine testing

We now proceeded to put a gas engine driven compressor on a similar cooling system. This was a 4 cycle, 4 cylinder 11" x 12" engine developing 150 BHP at 4.5" manifold mercury depression and 350 RPM. Whereas the original test engine had been set to operate at, or slightly above, atmospheric pressure, the "separation unit" on the compressor was set to hold a pressure of 10 lbs. or 240°F on the engine jackets.

Pyrex glass windows were installed in a cylinder jacket wall, top

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and bottom, over valve ports; in the head at 4 locations, in exhaust manifold cooling jacket and pyrex nipples in intake and discharge coolant lines. The water pump being also by-passed.

This compressor was put back into operation on April 16, 1952.

Since this compressor is used on well start up service, it is subject to load changes from light to maximum over-load at very frequent intervals. We have, in this way, been able to study and photograph boiling phenomena under all kinds of loads and speeds. Evaluation of observed phenomena was the really difficult part of these operations.

Results obtained

In my mind, probably one of the most important factors confronting us is the one concerning which the least is known. That is cylinder liner temperature under boiling conditions. Liner temperatures have been plotted against coolant in both high and low temperature direct transfer cooling but insofar as I know, not under boiling transfer. It is my opinion that such study would show the cylinder liner to be little, if any, hotter; straighter and more round than under normal cooling. This would explain beyond doubt the reason we are getting more power and smoother operation in our engines cooled by boiling.

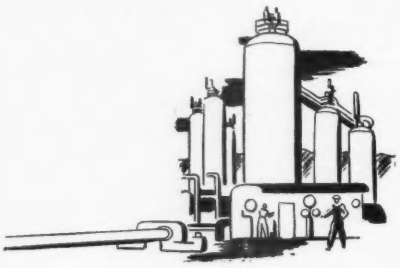
When studying boiling heat transfer, we learn that under established boiling conditions the interfacial heat transfer from a metal to a liquid is many times faster than under direct heat transfer. This greater speed of heat transfer leads to the very reasonable assumption that we are very materially lowering our metal temperatures.

We also learn that regardless of the metal temperature during growth of a steam bubble, upon separation of the bubble from the metal, the metal cannot be re-wet until it has locally dropped to the temperature of evaporation at existing pressures.

Since we have observed and our cylinder jacket photos have shown established boiling over the full length of the liner, it cannot be denied that such liner temperature is uniform and at low elevation along its entire axis.

A slight change in upper and lower cylinder temperature will be found due to varying differentials between wall temperatures and super-heat of water at different cylinder positions.

The amount of this variation could be shown by different values, when applied at varying cylinder elevations, of the boiling equation (t_l—Tsat), where t_l is inner liner temperature and Tsat is the saturation



temperature of the liquid at existing pressure.

Since no bubble can be formed until the liquid film adjacent to the liner wall has been superheated to a point above the saturation temperature, a similar temperature condition will exist along the entire cylinder length if full boiling is to be established.

Again it is easily seen that with boiling along the entire cylinder liner, such as we observe under full load, a uniformly true cylinder is maintained. To me this, in large measure, explains our increase in horse power and smoothness of operation.

Since the function of the equation (t_l—Tsat) is to control the amount of heat transfer by controlling the number, rapidity of growth, and size of bubbles formed, under full engine load, this equation will be functioning along the entire cylinder axis. And again uniformity of liner is indicated.

Under very light load, or with piping, boiling at the bottom would not occur. Heat transfer would be by direct interfacial action. In that event the above conclusions would not be entirely true. We should, however, be able to neglect this light load condition as the loaded engine is the one in which operators are most vitally interested.

A study of the foregoing leads to the thought that we are splitting hairs as regards temperature elevations. That is true. However, in our operations, we consider 1°F as normal temperature rise across the engine. Even one and a half or two degrees we consider excessive, so again we are splitting hairs and are at least consistent.

The above theories have led us to the belief that under boiling heat transfer our liner temperatures are normal at all times.

Several reactions have occurred in our engines under boiling phenomena which strengthen this belief. First, in extremely elevated temperatures up to 270°F, no detonating or loss of power occurred. Second, our crank-case temperatures remain normal at around 180°F.

Furthermore, the crank-case temperature does not appear to be affected either by engine coolant temperature or engine loading but is affected by ambient air temperature. As a result, we have removed all oil coolers on engines cooled by boiling heat transfer.

This has been possible because all these engines are of the dry piston type. With oil cooled pistons, it would be necessary to cool the oil. Cooling of the oil would, of course, need to be from some source other than the engine coolant.

In our low temperature compressor engines we maintain a load limit of, or near to, the manufacturers rating. On our compressors operating under boiling phenomena, the limits have been removed. Loading being left to the discretion of the plant operators. As a result, the operators are now loading these engines up to 117% of their rated horsepower.

A loading of 110% is considered safe and economical for 24 hour per day operation.

Economics of cooling by boiling

The value of any new method of operation should be measured in terms of: Cost, changes in efficiency, operating cost, and life of equipment. This last cannot be evaluated at this time.

When cooling by ebullition is compared with low temperature cooling, the first cost is favorable. On certain installations the first cost may be as much as 35% under conventional methods. In no stationary equipment should the cost be greater, and when compared with high temperature direct heat transfer cooling, the first cost will be about the same.

Savings in operating costs when cooling by ebullition as compared with cooling towers and radiator

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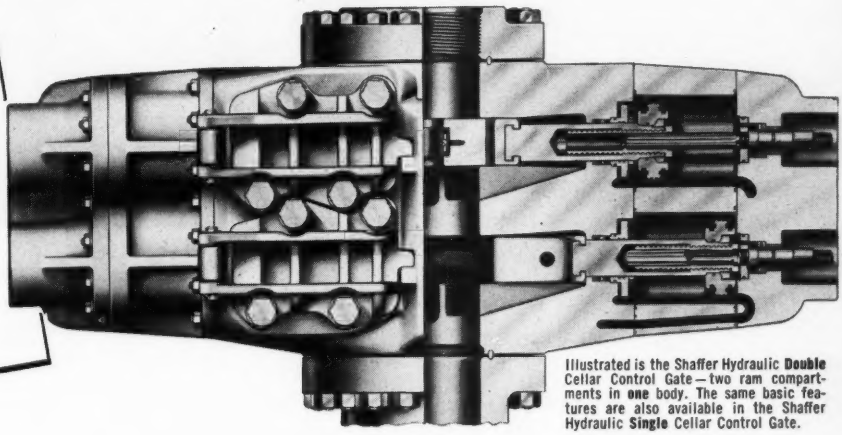
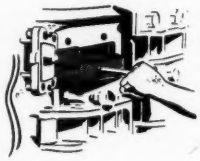


Illustrated is the Shaffer Hydraulic **Double** Cellar Control Gate—two ram compartments in **one** body. The same basic features are also available in the Shaffer Hydraulic **Single** Cellar Control Gate.



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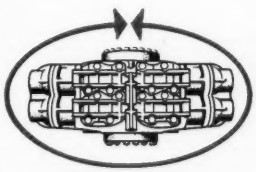
RAM CHANGES!

Changing rams in a Shaffer Hydraulic Gate is far simpler and quicker. Simply unbolt and open two doors, slide out the old rams, slide in the new—then close and bolt the doors. There's nothing to disconnect—and closing the doors automatically aligns rams for proper operation. Best of all, **complete ram changes can be made whether pipe is in or out of the hole!**



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SEALED DESIGN!

In Shaffer Hydraulic Gates all moving parts—including piston rod ram shafts—are completely enclosed within the Gate body. There are no exposed moving parts to become wedged or damaged by objects falling into the cellar—nothing to become corroded by chemical or salt drippings. Even the locking shaft is non-rising—fully protected!

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COMPACTNESS!

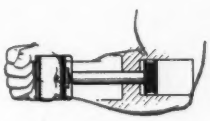
The Shaffer Hydraulic Double Cellar Control Gate contains **two** ram compartments unitized into **one** body . . . and even in sizes as large as 13⅜" (12" series 900) **requires only 30" total height.** Smaller sizes even less!

Compare these cellar-saving, space-cutting measurements against comparable equipment.

Compare

INTERNAL SAFETY!

With Shaffer Gates you don't have to worry about mud or sand interfering with free ram travel. The rams travel on high narrow guide ribs above the steeply-sloped ram compartment bottoms. Mud and sand quickly drain back into the well—with no detrimental accumulations to interfere with ram operation!



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Simple design means simpler maintenance, more trouble-free operation. Note how the operating cylinders in Shaffer Hydraulic Gates are **directly behind** the rams and operate through a rugged **one-piece** connection. No complicated multiple-element connections to wear or jam!

By making such a comparison you will readily see why these and still other important advantages engineered into Shaffer Hydraulic Cellar Control Gates make them, by far, the outstanding choice for protection against pressure emergencies. In fact, on every point essential to modern cellar control gate protection, this unit is unsurpassed.

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maintenance and operation is considerable. Cleaner engines, top and bottom, and less carbon deposits is another achievement. Noteworthy also is the fact that when using heavy duty lubricants, little or no deposit of ash occurs on valves, valve stems, and cylinder or piston heads.

In addition to the above we have an increase in thermal efficiency of around 40%. This increase is in the form of steam or waste heat recovered. We are using this steam to do useful work. Steam from our compressors is currently being used in heating crude oil preparatory to dehydration.

Steam from Kobe prime movers is being used to heat power oil and thereby reduces waxing in the pipe lines.

Each such installation has resulted in a partial or complete elimination of a boiler plant or direct fired heater. As a result, we are looking forward to increasing the number of engines cooled by ebullition on our leases in 1953.

In view of the limited amount of data available regrading boiling phenomena, it is only reasonable to suppose that parts of our conclusions may be subject to revision. A careful and accurate study of engine liner temperature under boiling heat transfer would probably be of more value than any one other thing. Such study would need to include wet and dry liners in both two and four cycle engines in both spark ignition and diesel cycle.

Until more information of such nature is available we will of necessity be restricted more or less to cut and try tests for increased efficiency in our operations.

Presented at the January, 1953 meeting of the California Natural Gasoline Association

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Governor Dan Thornton To Address Opening Meeting of AIME

With Governor Dan Thornton of Colorado, a forceful and provocative speaker, scheduled to make the principal address at the opening luncheon of the AIME Convention in Los Angeles, California, February 16-19, 1953, arrangements for the important event are rapidly rounding to completion. This is the 175th annual convention of the American Institute of Mining and Metallurgical Engineers, and an exceptionally interesting program is in prospect for the record attendance that is expected.

Governor Dan Thornton

Four days of intensive technical sessions and symposiums which will cover many significant aspects of mining metallurgy, and petroleum, have been fitted together into a well integrated program. Among the subjects to be discussed by the mining and metals groups are Geochemical Methods of Exploration; Crushing and Grinding; Solid-Fluid Separation; New Methods of Mining; and, indeed, almost all phases of the diverse mining and metallurgical field. The Petroleum Branch has been similarly comprehensive in its arrangements and has succeeded in setting up a program of pertinent topics, presented by authoritative speakers, that is bound to excite more than ordinary interest.

Special Student Activities Planned

If this particular convention could be said to have a theme, it might perhaps be stated thus, "For better engineers tomorrow, nurture the students of today." In any case, the entire schedule from beginning to end has been formulated with a keen concern for the welfare of students. One of the three meetings of the Mineral Industries Educational Committee will be open to them, and following a dinner meeting at Town & Gown Hall, University of Southern California, on Sunday, February 15 at 6 p.m., there will be for their special benefit, a panel discussion on Modern Mineral Engineering Curricula.

Students may attend the technical sessions of all divisions; may register, and receive technical papers without cost; and may even attend the welcoming luncheon free. In so far as possible each student will be sponsored by a member at the dinner smoker on Monday evening, February 16, and on Tuesday morning there will be a completely informal group session for students at which they will be privileged to meet present and past officers of AIME and many prominent people in the industries which AIME represents. This will provide an excellent opportunity for impromptu discussion and should be an altogether stimulating experience. Student activities are under the direction of Paul Andrews of Signal Oil & Gas Company, Los Angeles.

Field Trips Scheduled

Plans are well advanced also for a number of field trips to various nearby points of interest, including aircraft plants, automobile assembly plant, a cement plant with some unique underground operations, a rock, sand, and gravel plant, a large steel mill, and certain local areas that exhibit unusual geological characteristics. Travel aid will also be extended to out-of-town members who may wish to visit Mexico, Honolulu, or any of the western vacation spots.

Social Activities Diversified

To provide some relief from the succession of technical meetings, the program is agreeably interspersed with light events, for both the delegates and their ladies, that should be well patronized and thoroughly enjoyed. These begin with the welcoming luncheon at 12:15 on Monday, which is open to all attending members and students, and will feature special awards and citations, as well as the keynote speech by Governor Thornton. There will be a cocktail party at 5:30 p.m. on the same day, to which all registrants, ladies and gentlemen, are invited, and following that comes the traditional stag dinner-smoker, already mentioned. Next evening, Tuesday, at 9 p.m., an informal dance will be staged in the Embassy Room at the Ambassador Hotel, and on Wednesday evening is the annual banquet with all its interesting concomitants.

Personalities IN THE NEWS

Lyman and Batchelder Advance at Calif. Research

Election of A. L. Lyman to the newly-created position of executive vice president has been announced by the Board of Directors of California Research Corporation.

At the same time it was announced that A. H. Batchelder had been elected a vice-president and director of this Standard Oil Company of California subsidiary. He also will be general manager of the Cal Research laboratories at Richmond, California.

Lyman, who has been director of laboratories for Cal Research since 1946, joined Standard in 1924 following his graduation from University of California. He was made manager of the Company's Richmond laboratories in 1938, and on formation of California Research Corporation in 1944 was made a director of the new subsidiary company.

He is national Chairman of the Petroleum Division of the American Chemical Society for 1953, and a member of Alpha Chi Sigma, professional chemical fraternity.

Batchelder started with Standard in 1930. He has been assistant director of the laboratories at Richmond since 1946. Batchelder is known in the industry for his publications and patents in the field of asphalts, fuel oils, lubricants, resins and drying oils.

A. L. Lyman

A. H. Batchelder

Advancements Announced By G.P.

Six new executive appointments in the General Petroleum Corporation have been announced by R. O. Swayze, vice president and director of production.

E. V. Watts, named assistant to the director, has been superintendent of the production department's Southern division since 1949.

B. H. Robinson has been appointed manager of field operations. He has been manager of joint venture operations since 1947.

Succeeding Robinson as manager of joint venture operations is D. G. Kingman, assistant manager since mid-1952. Kingman was superintendent of the production department's San Joaquin division from 1945 to 1952.

Succeeding Watts as superintendent, Southern division, is A. W. Titus. He has been the division's production superintendent since 1950.

A. L. Hair has been named superintendent of the production department's Rocky Mountain division. Formerly drilling superintendent Southern division, Hair will make his headquarters in Salt Lake City, Utah.

H. H. Carrick, formerly assistant to the superintendent of the Southern division, becomes production superintendent, Southern Division.

All appointments are effective immediately, Swayze stated.

Stick Heads Geophysical Section of Lane-Wells

Reflecting the growing development and activity in geophysics, Lane-Wells has created a geophysical section to provide better service for its 8,000 oil company customers, according to Rodney S. Durkee, President.

John Stick, Jr., formerly chief electrical engineer and associated with Lane-Wells since 1937, has been appointed chief geophysical engineer in charge of the new section. During the war, Stick worked on a very special war project for the Division

John Stick, Jr.

of Physical War Research at Duke University. He is a graduate of California Institute of Technology.

A. B. (Burm) Winter, formerly assistant chief electrical engineer, has been appointed chief electrical engineer. He has had a varied experience with Lane-Wells since going to work as a gun perforating operator in California in 1934. Then he was division electrolog and radioactivity engineer in Oklahoma City. Next he spent 18 months in Trinidad as Lane-Wells representative. Then he was assigned to the Gulf Coast as division radioactivity engineer before being transferred back to Los Angeles. He is a graduate of the University of Washington.

Security Engineering Appoints Birnie

O. Hammer, President of Security Engineering Division, Dresser Operations, Inc., has announced the appointment of A. M. Birnie as divisional vice president and sales manager. Mr. Birnie is well known to both the production and drilling end of the oil industry. He first became associated with Security in 1944 as a special sales representative in California. In 1947 he was appointed Mid-Continent sales manager for Security with headquarters in Fort Worth, Texas. In 1952 he joined the Welex Jet Service, Inc. of Forth Worth as sales manager, resigning to again resume his association with Security. In his new position Birnie will direct all phases of sales and sales promotion for Security out of the Divisional home office in Whittier, California.

A. M. Birnie

Changes Made at Paloma Unit

Several supervisory changes in the Paloma Unit have been announced by Mr. T. H. Wallace, vice president, Western Gulf Oil Company. The Paloma Unit, located near Bakersfield, California, is jointly owned by six companies and operated by Western Gulf Oil Company.

Mr. E. A. Eastberg has been promoted to the position of superintendent of production for the Paloma Unit. Mr. Eastberg began work for Western Gulf as a carpenter in 1937 in the Fruitvale field and became a head roustabout there in 1942. In 1944 he was transferred to the Paloma field, and in the same year he became roustabout foreman there. He was made production and drilling foreman in 1945, and held this position until his latest promotion. In his various capacities in Paloma he has been actively engaged in the drilling and completion of most Paloma Unit wells, and is well versed in their history and in methods used to complete them. In his new position Mr. Eastberg has supervision over all field work, including production, maintenance and drilling operations. He is a member of the San Joaquin Valley Chapter of A.P.I. and of Petroleum Production Pioneers.

Mr. J. H. Jerome has been advanced to the position of superintendent of plant operations. He was employed at the Paloma Unit as an operator early in 1944 and was named plant foreman in 1945, a position he held until his latest promotion. Prior to coming with Gulf he had extensive experience dating back to 1920 in gasoline plants in California. Also included in his experience is work in South America from 1925 to 1932 at Maracaibo, Venezuela, where he was engaged in the building and operation of gasoline plants. He is a member of the California Natural Gasoline Association.

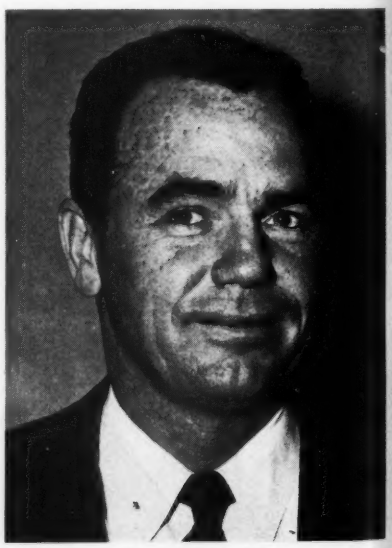
Mr. G. T. Naney has been appointed plant foreman to succeed Mr. Jerome. Mr. Naney was assistant plant foreman until his latest promotion. He served two and one-half years in the Army after finishing his formal education, and began work in the Paloma field for Western Gulf as a roustabout in 1946. Soon after that he was transferred to the Plant, and advanced from operator "B" to instrument man, and then to assistant plant foreman in 1951.

In connection with the recent Paloma Unit changes, the duties and responsibilities of Mr. William Fendrick, production foreman, were expanded. In addition to his field production supervisory duties he now also has supervision of field maintenance work. Mr. Fendrick was reared at Duquesne, Pa., near Pittsburgh. He began work for Gulf in 1935 in Mooringsport, La., as an oiler in a gasoline plant, and advanced to a process operator in plants in East Texas and West Texas until his transfer to California in early 1944. After service in the Plant as an operator "A" he was promoted to production foreman in 1945. He is a member of the San Joaquin Valley Chapter of A.P.I.

Lewis Named Baroid Manager of Mineral and Chemical Sales

Mr. Kemp S. Lewis has been appointed Manager, Mineral and Chemical Sales, by the Baroid Sales Division, National Lead Company, Houston, Texas.

A chemical engineer and graduate of Rice Institute, Mr. Lewis joined Baroid as a service engineer in 1939. He served as District Su-



Kemp S. Lewis

UOP CONSTRUCTION SUPERVISION PROTECTS YOUR INVESTMENT

The participation of Universal supervisory engineers in the construction of petroleum processing facilities adds an authoritative measure of confidence to the refiner's improvement or expansion plans.

Petroleum executives and contruction engineers recognize the wealth of practical experience gained by UOP engineers through their direction of a broad range of process construction projects throughout the world. And their concentration in the petroleum refining field has afforded them a specialized knowledge of the design, construction and operation of all types and sizes of processing units.

Universal construction supervision is a valuable asset to both the refiner and his contractor in assuring the scheduled completion of the project and its efficient on-stream operation — another important way in which Universal Service Protects Your Investment.

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Universal Service Protects Your Investment through laboratory research . . . pilot plant studies . . . design and engineering . . . construction supervision . . . licensee instruction . . . post on-stream service . . . collateral services.

perintendent in the Well Logging Department in 1941 until entering the Navy in 1942.

Discharged as a Lieutenant Commander in 1945, he rejoined Baroid and was made a Division Superintendent in the Well Logging Department in 1949. Just prior to his current appointment, Mr. Lewis was handling Bentone sales, which will remain under his supervision.

Bill Merritt Joins Dozier-Eastman & Co.

William O. Merritt, former sales manager of the Dynamometer Division of Clayton Manufacturing Company of California, joins Dozier-Eastman & Company, Los Angeles industrial advertising agency, as an account executive. Merritt will help service the Fluor account.

William O. Merritt

Before coming to Southern California in 1950, Merritt was with the Bear Mfg. Company, Rock Island, Illinois, for ten years as public relations and sales promotion director. Prior to this he was a staff writer on the Rock Island Argus and midwest newspapers.

During the war Merritt served as a Lieutenant in the Naval Air Combat Intelligence. He is a graduate of the University of Iowa where he distinguished himself as editor of the Daily Iowan.

Oilman Reese H. Taylor, general chairman of the Los Angeles YMCA's 1953 Support Campaign has announced co-chairmen in the drive for $650,000 to support youth work in the organization's 23 branches. Co-chairmen are Charles Crawford, Warren H. Crowell, Leo D. Gatlin, A. J. Gock and Harold F. Whittle. All are members of the YMCA's board of directors.

Basic Research Saves Petroleum

Due to basic research conducted for the last 25 years at the California Institute of Technology, many millions of barrels of gasoline-distillate have been saved for the oil industry.

The two principal investigators are Drs. William N. Lacey and Bruce H. Sage, who carried on their work in a Caltech lab with apparatus that enabled them to reproduce the tremendous pressures existing in deep wells. The two research experts, both chemical engineering professors, found a phenomenon called retrograde condensation.

They established that under extremely heavy pressures much of the liquid in the liquid gas combination was changed into gas, but it returned to a liquid state as the pressure lowered again.

This conveyed the knowledge that the petroleum industry was losing great quantities of oil by permitting underground pressures to fall below a certain value, in which case the gas was converted into liquid and the liquid was trapped in sand pore spaces.

Gas is recovered more easily than liquid. Therefore, a solution to the problem was the setting up of cycling plants to maintain underground pressures so that the condensate could be brought to the surface as gas.

Once above the ground, the liquid is taken from the gas at reduced pressure. The dry gas remaining is then recompressed and pumped below ground again. After all the liquid is recovered, the gas itself is sold for heating and other purposes.

The quarter-century investigation has been sponsored by the American Petroleum Institute. The two scientists were recently honored at an anniversary dinner.

New officers of the Los Angeles Chapter of Nomads elected at the annual business meeting January 14, 1953, together with the retiring officers. Left to right, seated: Bob Craig, of National Supply Company, treasurer 53 and assistant treasurer 52; John Flanagan of Johnston Testers, Inc., vice president 53 and treasurer 52; Jim Hughes of Lane-Wells Company, president 53 and secretary 52; Bill Wilson of Web Wilson Oil Tools, Inc., junior regent 53 and president 52; Joe Schlarb of Chiksan Company, sergeant-at-arms 53 and deputy sergeant-at-arms 52. Standing: Ox Morgan of Oil Well Mfg. Company, deputy sergeant-at-arms 53; Earle Boggess of Baker Oil Tools, Inc., senior regent 52; Jerry Engstrand of Western Geophysical Company, senior regent 53 and junior regent 52; Leo Cypher of Baash-Ross Tool Company, assistant treasurer 53; and Wally Sawdon, executive secretary. Not shown: Bill Sargent of Sargent Engineering Corporation, secretary 53 and sergeant-at-arms 52; Vern Mitchell of Security Engineering Div., assistant secretary 53; and Bennie Mater of Baker Oil Tools, Inc., assistant secretary 52.

No "SHIP-IN-A-BOTTLE" construction

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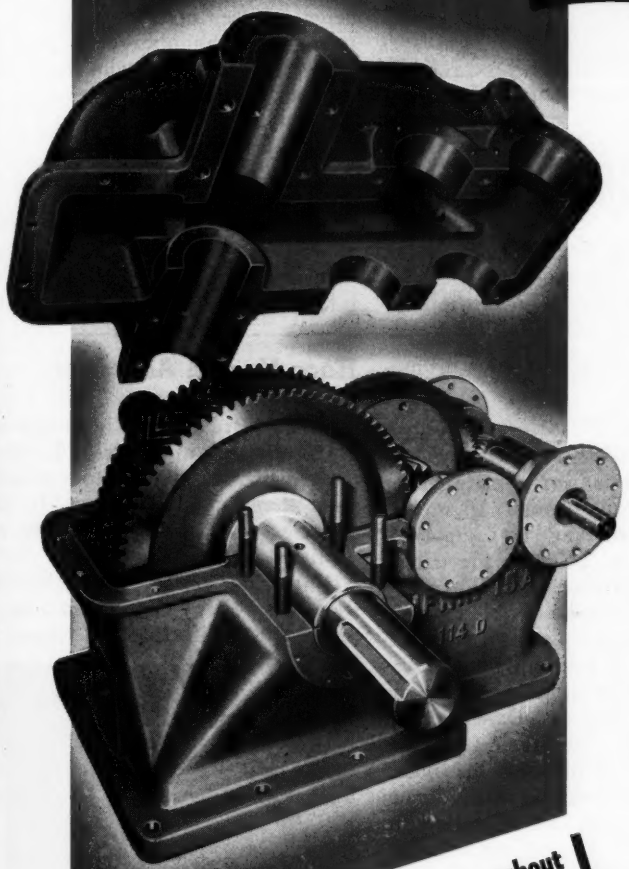
TWO-PIECE GEAR HOUSING



Plenty of "BEEF" throughout which is typical LUFKIN DESIGN POLICY

Provides easy accessibility for assembly and inspection

- Allows main gear to be assembled on shaft with heavy 60 ton pressed fit. All rotating parts easily set in place before cover is bolted on. No "threading" of shafts and bearings as necessitated by solid gear box with no split.
- Made of High Tensile Lufkaloy-Iron heavily ribbed inside, giving smooth exterior, pleasing in appearance and easy to keep clean.
- Large Heat Treated Alloy Steel Studs capable of carrying ten times rated load without stretching.
- Large Clean Out Hole for removing sludge from bottom of box.

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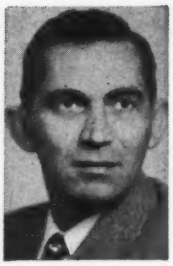
PACIFIC COAST DIVISION—5959 So. Alameda, Los Angeles 1, Calif.

Executive Appointments Announced by Schlumberger

Four new appointments to the Houston headquarters of Schlumberger Well Surveying Corporation have been announced by W. J. Gillingham, executive vice president.

They are: L. A. Allaud and H. A. Nystrom, technical assistants to the vice president, operations and general services; R. K. Thies, assistant to the vice president, personnel relations; and Clark Edgecomb, assistant to the sales manager.

Mr. Allaud is a native of France and joined SPE in Paris in March, 1935. He came to the United States the following year and went to work for Schlumberger Well Surveying Corporation as an engineer in New Iberia, La. He has served as division manager in Wichita and area manager in Tulsa. In 1948 he was transferred to Surenco and served in South America. Since March of 1952 he has been located in Fort Worth serving as assistant to the Northwest Texas area manager.



Allaud

Nystrom

Edgecomb

Mr. Nystrom was born in Minneapolis and received his Master's degree in physics from the University of Minnesota. Joining Schlumberger in 1937 he served in Louisiana and Texas before being assigned to Mt. Vernon as district manager. He was also district manager at Reed City, Michigan and Mt. Pleasant, Michigan before being made assistant to the Northeast area manager at Mattoon, Illinois. He served in the same capacity in New Orleans and was then made division manager at Gretna.

Mr. Thies received his Bachelor's and Master's degrees from the University of Colorado. After joining Schlumberger in 1939 he served at Corpus Christi, Houma, Lake Charles, Jackson, and Winfield before entering the U. S. Navy in 1943. He was made a lieutenant and saw action in the Pacific theater before being released in 1945. When he returned to Schlumberger he was assigned to Shreveport, and then Tyler as district engineer, where he stayed until his recent appointment.

Mr. Edgecomb attended Santa Barbara State College and the California Institute of Technology. In 1943 he joined Schlumberger and has worked in both Long Beach and Ventura. He has been district engineer at Ventura since March, 1948.

Read Named Assistant to Quisenberry at Axelson

John H. Read, formerly sales promotion manager of Burgess Battery Co., Freeport, Illinois, and operator of "John H. Read Advertising" at Evansville, Illinois, for several years, has joined Axelson Manufacturing Co., Division of Pressed Steel Car Co., Los Angeles. He will work with Jack L. Quisenberry on the company's advertising and sales promotion program.

John H. Read

Nomads Annual Ball

All plans have been completed for the Fourteenth Annual Inaugural Ball of the Los Angeles Chapter of Nomads to be held at the Hotel Statler on Valentines Day, February 14, 1953. It will be preceded by a cocktail hour at 7 p.m. in the Sierra Room which is adjacent to the Pacific Ballroom where dinner will be served at 8:30 p.m. Dancing will start at 9 p.m. with music furnished by Leighton Noble and his noted orchestra. From 450 to 500 Nomads and their guests are expected to attend.

The committee in charge consists of Bill Sargent of Sargent Engineering Company, general chairman; Joe Schlarb of Chiksan Company, assistant general chairman; Bill Bettis of Johnston Testers, Inc., arrangements; John Flanagan of Johnston Testers, Inc., music; Leo Cypher of Baash-Ross Tool Company, finance; Dick Winder of Chiksan Company, publicity; Ray Humphreys of Axelson Mfg. Company, reception; and Wally Sawdon of Technical Information Service, program and tickets.

Haas Named Adv. Mgr. Jorgensen Co.

George B. Haas has been appointed advertising manager of Earle M. Jorgensen Co., distributors of steel and aluminum,with plants in Los Angeles, Oakland, Houston and Dallas.

Born in Omaha, Nebraska, Mr. Haas received his schooling in Southern California and upon his

George B. Haas

graduation from UCLA's College of Business Administration in January, 1941, he went to work in The Adjutant General's office in the War Department, Washington, D. C. There he assisted in the preparation and administration of educational examinations for reserve and national guard officers who were applying for commissions in the regular army. He entered the navy as an ensign in September, 1942, and served on the staff of Commander Service Force, Pacific Fleet.

After his discharge as a lieutenant in 1946 Mr. Haas joined the Jorgensen organization in Los Angeles and has had a thorough training in the company's sales and advertising departments.

Lufkin Advances Frazer And Monroe

Two personnel changes have been announced by Lufkin's V. J. Fawcett.

L. Carl Frazer, formerly of the Los Angeles office staff, becomes resident sales representative in the San Joaquin Valley for all Lufkin Foundry & Machine Company products. Frazer's training and experience gained in 6 years affiliation with the Pacific Coast Division's operations will enable him to render a valuable and helpful service to Lufkin's many friends and customers in the Valley, Mr. Fawcett stated.

Mr. Ray Monroe assumes the company's Los Angeles office responsibilities. His duties are directed toward supervision of equipment schedules, shipping schedules and purchasing.

Lufkin's Valley headquarters are located at 30th and M Streets, Bakersfield, California.

L. Carl Frazer

Ray Monroe

Signal Oil Company Appoints T.B.A. Manager

Signal Oil Company, Los Angeles, announces the appointment of W. P. Thoreson, manager of T.B.A. (tires, batteries and accessories) sales.

Mr. Thoreson joined the Company in 1938 as a service station operator.

In 1946, shortly after returning from the military service, he first became associated with the Company's T.B.A. Department as a salesman. Two years later, he became manager of this department for the Southern District.

In 1950, he was made assistant merchandising manager of T.B.A. and for the past two years, has served as assistant to the sales manager, T.B.A., home office.

Jack Crawford, son of W. M. Crawford of the Crawford & Hiles independent operating organization at Long Beach, is not only a student of note at USC but a top trumpeter as well. During the recent holiday season, Jack along with Ed Lloyd, Jr., pianist, were the chief providers of music at a Big Bear resort. Lloyd also is enrolled at USC.

Genial Walt Parker, veteran oil producer, has moved his office to the General Petroleum Building in Los Angeles.

Langton Joins Clark Agency

To provide greater service facilities for its clients in the oil, chemical and mining industries, Arthur Langton, well-known advertising man, editor and writer, has become associated as an account executive and technical writer with Darwin H. Clark Co., one of the largest industrial advertising agencies in the West.

Langton is well-known throughout the oil, chemical and mining industries, having been editor of the Baroid News and advertising manager of the Baroid Sales Division of National Lead Company, a concern with which he was associated for 16 years. He is the author of many technical, historical and general interest articles and was the founder and editor of a golf business publication, as well as Pacific Coast representative for two national golf trade papers. He is associate editor of "The Engineer" and a contributing editor of "Subsurface Geologic Methods." A graduate of the University of Southern California, he was one of the editors of the Daily Trojan.

The Clark agency, with headquarters in its own 2-story building at 1139 West 6th Street, Los Angeles, has received many awards for excellence of newspaper, trade paper, direct mail and outdoor advertising, and financial reports prepared for clients. It is the exclusive Los Angeles member of Transamerica Advertising Agency Network, with associate offices in 18 leading cities.

Arthur Langton

Rocky Mountain NEWS

Colorado—Idaho—Montana—New Mexico—Utah—Wyoming—Western Canada

Montana

Interesting shows have been found in two eastern Montana tests, with the No. 1 Pohle in Sheridan County recovering 125 feet of oil and gas cut mud from the Charles on drill stem test at the interval 6988-7006 feet. Operator is Williston Pioneer-Deardorf and Shepherd, and the wildcat is located in c nw se 13-35n-55e.

Sun Oil and Phillips Petroleum found shows in their No. 1 Dynneson, c sw ne 32-24n-58e, in Richland County. The shows came from the limestone at the interval 9614-72 feet. Operator was drilling below 9675 feet at last report.

In McCone County, Shell Oil Co. installed pump at its Duck Creek wildcat, 25-22n-48e, after swabbing 122 barrels of fluid, including 59 barrels of oil, per day.

Other activity by Shell in McCone County includes a second wildcat in the Southwest Richey area after the company brought in a discovery in that sector. The new test, 19-22n-48e, is drilling around 6250 feet. The same company also is drilling a wildcat in the Silver area, 5-22n-48e, north of the Southwest Richey area discovery.

Wyoming

The J. D. Sprecher Drilling Co. is conducting completion tests on an important extension of the Clareton field in Weston County. The well, the No. 1 Mary Wakeman, sec. 1-42n-66w, flowed at the rate of 1289 barrels of clean oil per day on a 12-hour test from the Newcastle sand, which was topped at 6642 feet. The well is three and one-half miles west of established production in the field.

Ohio Oil Co. was testing what was believed to be the Frontier formation at its No. 1 Unit in the South Cedar Ridge area of Carbon County. Gas shows have been unofficially reported but the operator has made no announcement of recovery. The well was scheduled as a test of the Sundance, which was expected at 9500 feet. However, it is bottomed at 10,135 feet and the Sundance apparently not yet reached, indicating that the structure is running considerably lower than estimated. It has not been revealed whether drilling will continue to the original objective.

At last report Sinclair Oil and Gas was coring ahead in the Phosphoria at its No. 1 Govt. in the North Sand Draw area of Fremont County. A drill stem test of the interval 10,381-10,403 recovered 180 feet of heavy gassy mud and a half gallon of heavy black oil. Previous shows had been found in the Dinwoody, upper member of the Embar-Phosphoria group.

Development drilling gathered impetus in several Wyoming fields in January, apparently stimulated by greater opportunities for moving the crude oil to markets of the Middlewest. Several locations were staked in Grass Creek, Little Buffalo Basin, Sage Creek, and in the Meadow Creek-Sussex fields.

R. L. Bowcutt Named Rocky Mountain Manager by Baash-Ross

R. L. "Don" Bowcutt, well-known to oil men in the Rocky Mountain area, has recently been named by Baash-Ross Tool Company as district sales manager for Rocky Mountain and Western Canadian operations.

R. L. Bowcutt

Don has been with the Baash-Ross organization for a number of years, most of them in the Rocky Mountain area, and before joining Baash-Ross, was prominent in oilfield operations with one of the major oil companies in Montana. His extensive background in the particular requirements of this area makes him ideally equipped for the still greater responsibilities now placed on him.

Utah

The California Co. plugged its No. 2 unit in the Antelope Creek area of Duchesne County after drilling to 5663 feet. The well was drilled into the Wasatch before abandonment. A showing of oil was found in drill stem test at 4230-90 feet but additional tests of the same interval failed to recover anything but mud.

Hathaway Co. Big Horn-Powder River and Cheyenne Oil Ventures Inc. plugged their No. 1 Govt. in the Hovensweep area of southeastern Utah after drilling to 5678 feet.

An attendance of 1,500 members is expected for the third annual meeting of the Rocky Mountain section of the American Association of Petroleum Geologists to be held in Casper, Wyo., April 22-24. L. F. McCollum, president of the Continental Oil Co., will be the principal speaker. Previ-

ous meetings were held in Denver and Salt Lake City.

Several speakers will discuss various productive areas of the Rockies, and nearly an entire day will be devoted to the Williston Basin.

W. H. Curry of the Far West Oil Co. is general chairman of the convention, and J. F. Partridge, also of Casper, is chairman of housing arrangements.

The University of Wyoming at Laramie, Wyo., will be host to the Wyoming Geological Association Field Conference July 30, 31 and Aug. 1. Dr. S. H. Knight and Dr. Horace D. Thomas, state geologist, will be general chairmen.

The field trip will be taken to the Laramie Basin of Wyoming and the North Park Basin of Colorado.

North Dakota

On a test of the interval 3353-85 feet, the No. 1 Berentson, c sw se 21-163n-80w, pumped eight and one half barrels of oil per day. Earlier tests of practically the same interval showed 13 barrels of oil per day. This is the discovery well by Zack Brooks and Crawford Smith in the Turtle Mountain area of Bottineau County. The development stimulated other wildcat activity in the area. Production is from the Charles which was topped at 3337 feet.

Another wildcat in the same general area, the Ward Williston Drilling No. 1 Bert O. Klokstad, recovered oil and drill stem test of the Madison, topped at 3072 feet. The well is located in ne nw 36-164n-79w. Seven miles to the west the same operator is drilling the No. 1 Gorder, which found shows in the Charles.

Standard Oil Co. (Ind.) has awarded contract to the Lummus Co. of New York for a refinery at Mandan, N.D. The plant will have a capacity of 30,000 barrels per day. It is expected to be completed in October of 1954.

Colorado

Wheeler and Gray recovered gas at an estimated 4,000,000 cubic feet per day from their No. Giacomini, c ne nw 21-9n-52w, in Logan County. The test was made at the interval 4495-4507 feet. Another test at 4507-27 recovered an estimated 2,800,000 cubic feet per day. Production was from the D sand. The wildcat is northeast of the West Padroni field.

Twin Oil Co. was preparing to complete the No. 1 Cuykendall which recovered oil from the J sand, topped at 7012 feet. On a drill stem test lasting 150 minutes operator recovered 6934 feet of oil and 90 feet of oil cut mud. The well, in nw nw sw 12-2n-63w, is in southern Weld County.

Hiawatha Oil and Gas and Penn-Ohio Oil were drilling around 7225 feet at their No. 1-25 Govt. in Jackson County. Drilling had been delayed by a fishing job. The well, in c sw sw 25-7n-81w, is an offset to the M. E. Davis wildcat which found oil production in the Frontier.

Nebraska

Four wildcats in Kimball County were undergoing further tests after finding showings of oil. These were Anderson-Prichards Oil, Rogers Oil and Bert Wheeler's No. 1 State, Harry Royster's No. 1 Evertson, Forest Oil's No. 1 Marcum and Leon

(Continued on page 35)

TESTED
and PROVEN
in the
FIELD
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They have weathered the test and with Midway servicemen, have earned a reputation and respect among operators throughout California.
On your next difficult job — try Midway.
P and M POSITIVE RELEASING SOCKET (Packoff)
DUMBLE JAR-TYPE KNUCKLE JOINT
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MIDWAY FISHING TOOL CO.
SINCE 1910
LONG BEACH
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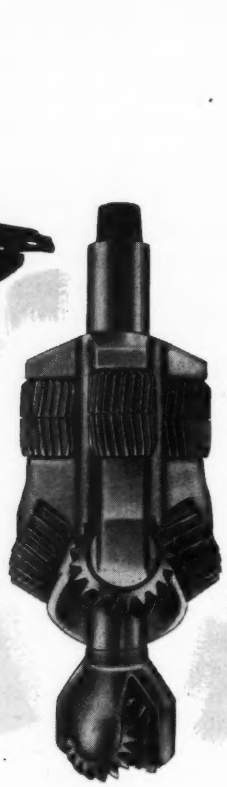
H. C. Smith makes Hole Openers in a full range of sizes



6-POINT HOLE OPENERS
available in sizes from

$7\frac{5}{8}''$	to	$32''$

Available with either rock bit pilot or bull nose pilot

3-POINT HOLE OPENERS
available in sizes from

$10\frac{5}{8}''$	to	$26''$

H C Smith OIL TOOL CO.

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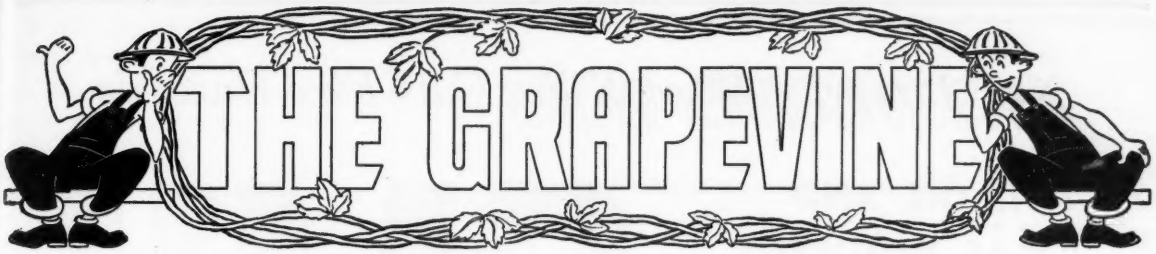

With justifiable pride and becoming decorum, that estimable institution, the National Supply Company, celebrated its fortieth anniversary, in December, 1952. The founding of the plant, a consequential event in itself, had the immediate effect of bringing into being what is now the bustling bailiwick of Torrance, which merely goes to show that free enterprise, like Uranium 238, can also produce chain reactions, and much more pleasant ones than those attributed to the rambunctious metal up to the present time. The pioneers who originally dreamed of a great manufacturing plant, probably little thought that a town of 40,000 people would one day stand in testament of their good judgment. Yet, that is only one of the benefits that have accrued to California and to the country at large, from the creative efforts of these early adventurers in industry.

When a new enterprise is launched, takes root, and thereafter enjoys a healthy growth, it usually happens that other industries move in, and local development becomes a pyramiding process that rapidly enriches the entire surrounding territory. The enrichment expresses itself in the form of satisfied workers, good homes, churches, schools, hospitals, recreational facilities, and all the diverse accoutrements and agencies that make life a constructive and comforting experience. John Spalding, the very modest but fully capable works manager of National Supply Company's Torrance plant, is naturally proud of the outstanding accomplishment that has marked the first 40 years of effort by the "blue iron institute."

He notes that Walter Moll, Ed Timbs, and Fred George were in on the start of things 40 years ago and are still on the roster of Company employees, and he hopes that 40 years hence, there will be many more who will look back on today as the starting point of new and still greater achievements. Them's also our sentiments, so to the discerning management of National Supply Company and its fine corps of employees, congratulations on 40 mighty productive years and our

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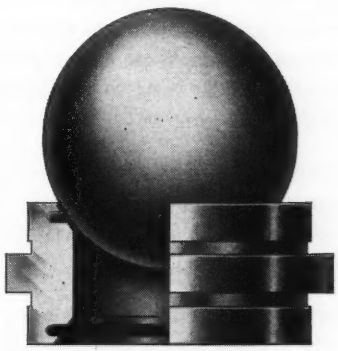

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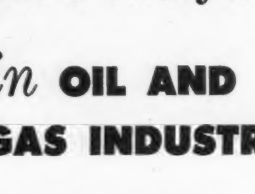

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Du Pont CMU kills weeds and prevents regrowth. It controls most species that are a problem around West Coast industrial locations, and it is easy to use because a little CMU goes a long way.

- Eliminates fire hazards caused by unwanted vegetation. Applied just before or during the rainy season, it stops growth early for dry-season protection.
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- Economical, low application rates keep ground clear through an entire growing season or longer.
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- Comes as a powder to mix with water. Non-flammable, non-volatile, non-corrosive to equipment.

Where do you want to kill weeds?

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best wishes for at least another forty of the same!

The opening of the luscious new quarters of the Petroleum Club of Los Angeles on the ballroom floor of the Statler Hotel on January 9 was one of the nicest gatherings that has taken place in our village in a long time. Principally, that was so because the latest edition of the Petroleum Club is just about as inviting as anything you could imagine. There is nothing flamboyant or garish about what the experts call "the decor" but the entire effect is as soothing and satisfying as a well prepared mint julep. Not too long ago we had looked in on the Club section with Bill Bettis and John Flanagan, the Johnston Tester chaps, and came within an ace of being incorporated in the cement flooring by an overzealous workman who was dumping slurry and was certainly no respector of Nosey Parkers. By doing a fast figure eight, however, like the old hockey player that we are, we escaped this deliberate attempt to give us the Edgar Allan Poe routine. Actually, though, what we were leading up to was that the place was shambles and like a lot more skeptics we were quite sure it would never be ready by January 9.

But it was and you have never seen 700 people so unanimously and so pleasantly surprised as were the participators in the opening exercises. The place is simply attractive and comfortable beyond expression, and Henry Salvatori, Paul Huggins, Jim Leovy, Tom Sherman, Dick Sherman, Tork Torkelsen, Stan Williams, Frank Morgan, and Mort Kline, the nine incorporators of the Club, must be mighty proud today of the manner in which their dreams have materialized. We can well remember the work and thought that were put into the interior decorating and furnishing of the first quarters at the Biltmore by Henry Salvatori, Paul Huggins, Rollin Eckis, and E. Fritz Davis, to whom supervision of that important aspect of the Club's development was entrusted, and we can certainly say now that it couldn't have been in better hands.

The Biltmore quarters were much smaller but they were inviting. They had a warmth, a sort of personality that we all came to love—perhaps because for most of us it was the birthplace of new and valuable associations. It was a place where casual acquaintance blossomed into lasting friendship. It was a place where for a brief interval each day busy oil people could relieve the tensions of their workaday worlds and relax in an atmosphere of good natured raillery that was at once healthful and enjoyable.

But adequate as the Biltmore quarters were for a while, it would have been sheer selfishness not to make some effort to expand the Club fellowship and to share it with the many other fine people who for the moment were excluded by space limitations and certainly not by any lack of qualification. That's why the directors decided, when it became evident that there was no additional space available in the Biltmore, to open negotiations with the Statler. The results of these negotiations we now have in tangible and altogether pleasing form.

At the preview luncheon on the opening day at the new Statler quarters, Phil Magruder, current president, paid high tribute to Stan Natcher, vice president and chairman of the house committee, for the tireless efforts he and the other gentlemen on the committee had put forth, not only to complete the rooms on schedule but to complete them in such elegant style. This was a well deserved encomium for Stan and his several aides mothered the whole project with undiminishing vigor and a lot of intelligent planning. The other members of the house committee who concentrated on this important assignment were Tom Sherman, Basil Kantzer, Rollin Eckis, Wendell Jones, Ham Bell, and Joe Hudson, about as accomplished a group of executives as you could well find. The president in his remarks also commended the firm of Cannell & Chaffin, interior designers, for the excellence of their contribution; and Holabird & Root & Burgee & Associates, architectural consultants, for the interesting structural innovations that added so much to the total effect.

There is no question that the Petroleum Club of Los Angeles is now one of the real show places of the

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CLEVELANDER MAKES GOOD IN L. A.

Gene Graham, vice president of Thomas P. Pike Drilling Company, is a native of Cleveland, Ohio, who obeyed the Greeley injunction and struck out for the Golden West way back yonder in 1919. There were no covered wagons in those days, so he had to make the long trek by train, living precariously in dining cars and lounges during the day, and having no place to sleep but a Pullman through the long watches of the night. Gene, however, was a rugged boy, and his constitution and perseverance finally brought him to the City of the Angels, where in due course, he equipped himself for his subsequent adventures by acquiring an M.E. degree at Cal Tech.

He began his oil career with Baker Oil Tools in the machine shop on bald end of a broom, and still thinks his work in the corners and around posts was exceptional. He was with Baker for some eight years and particularly enjoyed the Wilmington boom period of 1937-38 when the firm furnished many odd cementing accessories to the Harbor operators. He skipped from Baker to the Bedaux Company in 1941, an association of industrial engineering consultants, and for the next three years was engaged in production engineering and wage incentive work in mid-west war plants. Returning to Los Angeles in 1944, he officiated as manager of Grant Oil Tool Company until 1948, and thence moved over to Rocky Mountain Drilling as assistant to Dorsey Straitiff. His affiliations with Pike Drilling began in January, 1952.

Gene is a tall, nice looking, neatly attired young chap who seems to be pretty thoroughly engrossed in his work. Nonetheless, when the occasion is right, he can divert his attention easily and enjoyably to less consequential matters. His principal hobby is gardening, as may be noted by the above sketch, and he is seriously thinking of planting his lawn in dandelions and devil grass because that's what comes up anyway. He has another hobby, stimulated by his fifteen month old daughter, Cynthia Louise. That is the invention of children's toys and games. Which reminds us that a popular children's game in Scotland is one in which the kids are taught to save by making believe that the pay-type gas meter is a piggy bank. Gene's creations have, of course, no such ulterior motive and are designed solely to develop the favorable aptitudes of children and simultaneously provide them with amusement.

City not, as already intimated, because of any degree of flamboyancy or suggestion of affluence but rather, to the contrary, because of its quiet distinction, its most pleasing blend of coloring, and its entire aura of good taste. Even the most meticulous of the ladies at the cocktail party on the opening night could find no reason to charge their men folk with chromatic incompetence, and generously endorsed the new layout from stem to stern. By the way, we noted among those attending the cocktail party at least three delegates from as far away as Houston, Texas, namely, Paul Huggins, Ed Fisher, and Tommy Johnston, which reminds us that Paul Huggins was the first president of the Petroleum Club. He was followed in office by Henry Salvatori, Rollin Eckis, and Phil Magruder. Which also reminds us that we have failed to mention the goodly efforts of a number of people who have had quite a lot to do with the success of the Club, notably Stan Williams, first secretary; Howard Pyle, first treasurer; Jim Leovy who looks as if he might be secretary for a generation or two; Mort Kline who ironed out all legal entanglements; Bill Geis, former vice president, and incumbent director, whose time and talent have been given liberally to the enterprise; Roy Barnes, tournament manager and director; Al Mitchem, director and house committeeman; L. L. Aubert, director, who handled the membership expansion program in rare style. There have been many others who have made outstanding contribution to the cause but our space—editorial space, that is—being limited we have no recourse but to call a halt to the name naming.

Membership now approximates 700 and it is, of course, to the continued interest and patronage of these members that the stability and the healthy growth of the Petroleum Club must be attributed. It has been the regular noon meeting place of many fine people in all phases of the petroleum industry and its success is concrete evidence that there was and is a definite need for such a meeting place. We have no statistics on the matter at the moment but it would be interesting to know just how many ulcers have become homeless since the Petroleum Club first began operations in August 1949.

Among the important units that participated in the Inaugural parade at Washington, D. C., when General Eisenhower was crowned King of Capitol Hill, and its subsidiary, the United States, on January 20, was a contingent of fifty mounted police from Long Beach, sometimes referred to as the capital of Iowa. These beautifully caparisoned steeds and their well accoutered riders not only represented the noted beach metropolis in a very adequate way, but of them, to wit, Al Stevenson, widely known oil producer and gin rummy authority, personally represented the Petroleum Club of Los Angeles, and he carried with him a neatly worded and tastefully adorned scroll which he presented to Ike in the Club's behalf.

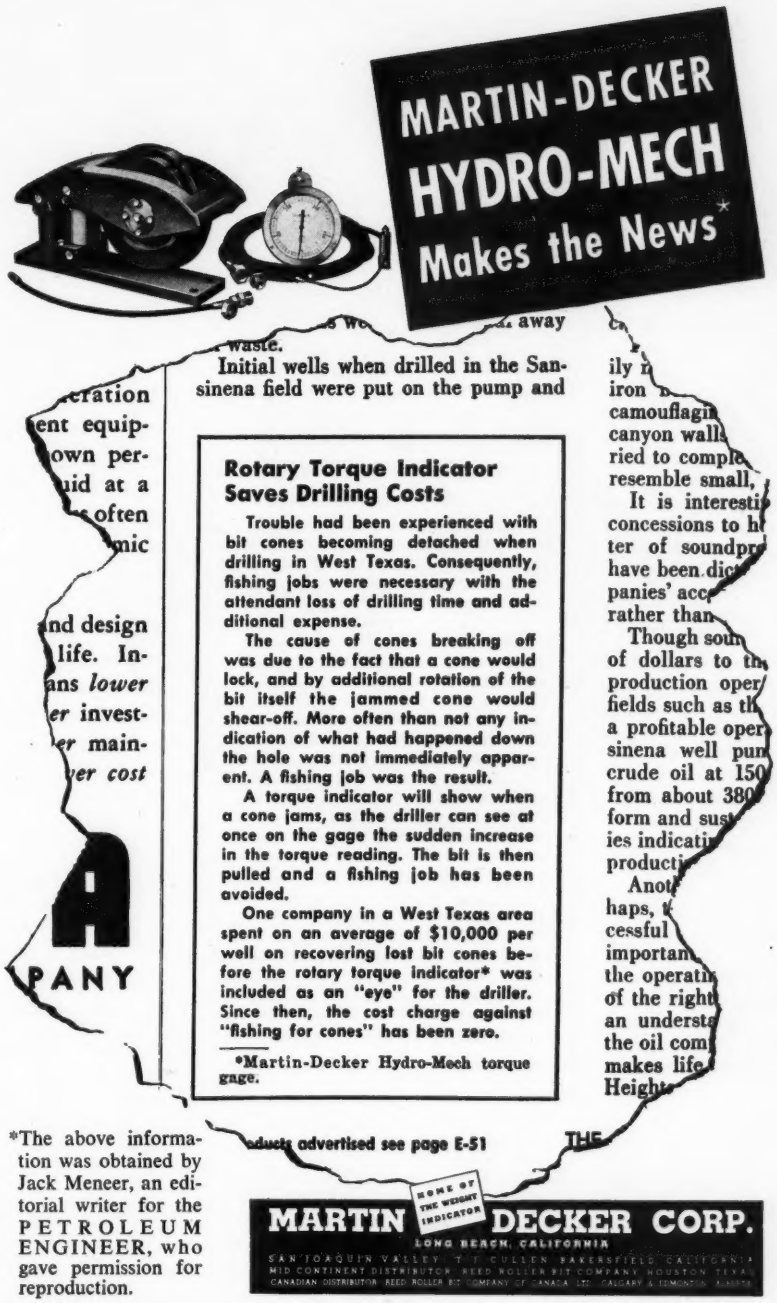
It was quite a trick, we understand, getting the wherewithal to ship fifty horses and their fifty masters on a private train back to D. C., but of the $34,000 required to defray the expenses of this equestrian whingding, Long Beach put up $10,000 and the riders kicked in with the rest themselves. They made an imposing display even in such an imposing array. There are quite a number of oil men in this interesting group and among those who made the trip were Vic York, Frank Vessels, Earl Myers who, incidentally, is president of the organization, Earl Hughes and Hal Haney.

The Western Pipe Liners Club winter meeting was held recently out at the Turf Club and by all accounts was a most interesting session. Feature of the evening was a showing of his peregrinations in Venezuela by "Al" Alcorn, the Shell Company chap who has spent quite a lot of time down below the border in the past couple of years and has accumulated many fine pictures to illustrate his dissertations on the Venezuelan adventure. Certainly his presentation on this occasion was

thoroughly enjoyed by his fellow pipe liners. Another important event in pipe line history recognized by this august assembly, was the retirement of one of their highly respected members, Harry Brown of Hood Construction Corporation. The Brown record was pretty well probed during the evening and there was a good turnout to hear the details, all of which added more spice to a gathering that was already nicely garnished with the things that make for a pleasant evening of association.

With Graydon Oliver, the consultant and a dangerous cookie in a domino brawl,we teamed recently in a futile effort to wrest some laurels and other more material chattels, from Dean Walling, the Western Geophysical executive, and his partner, Bob Sibert, of the Pearson-Sibert and other consequential enterprises. This was perhaps the most disastrous foray in speculative territory ever undertaken by a member of our ordinarily super-cautious tribe, and we could see by the look on Graydon Oliver's customarily placid countenance that he was disturbed, He appeared to be sort of wishing that he had been more careful in chosing either a partner or an opponent, we couldn't tell which but we had a horrible suspicion. Anyway, to put the matter bluntly, our side was soundly and humiliatingly trounced, all of which has lowered our morale to a highly hazardous degree. At the same time it has required the liquidation of certain trust deeds and securities which we had expected to see us through a rapidly approaching old age. Oh, woe is us!

We were distressed no end to learn a short time ago of the death of Wally Rushing, our fellow Nineteener, and one of the grandest chaps we have ever known. Wally was stricken with a heart ailment some time ago, seemed to recover, and then passed away suddenly. He was with E. H. Edwards Company and was widely known and much respected among the petroleum people of the West. Our keenest sympathy goes out to his family and friends.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Makes the News*
Initial wells when drilled in the Sansinena field were put on the pump and
Rotary Torque Indicator Saves Drilling Costs
Trouble had been experienced with bit cones becoming detached when drilling in West Texas. Consequently, fishing jobs were necessary with the attendant loss of drilling time and additional expense.
The cause of cones breaking off was due to the fact that a cone would lock, and by additional rotation of the bit itself the jammed cone would shear-off. More often than not any indication of what had happened down the hole was not immediately apparent. A fishing job was the result.
A torque indicator will show when a cone jams, as the driller can see at once on the gage the sudden increase in the torque reading. The bit is then pulled and a fishing job has been avoided.
One company in a West Texas area spent on an average of $10,000 per well on recovering lost bit cones before the rotary torque indicator* was included as an "eye" for the driller. Since then, the cost charge against "fishing for cones" has been zero.
*Martin-Decker Hydro-Mech torque gage.
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*The above information was obtained by Jack Meneer, an editorial writer for the PETROLEUM ENGINEER, who gave permission for reproduction.

Standard Oil Education Donor

Standard Oil of California this year will make grants to leading universities and students totaling more than $200,000, according to President T. S. Petersen. Massachusetts Institute of Technology will receive $50,000 for special fundamental research expenses. Grants-in-aid of $10,000 each go to California Institute of Technology, Stanford, Princeton and the University of Chicago. Individual graduate fellowships are awarded to 31 students and 23 universities.

Gasoline Demand Expected To Rise

Gasoline demand is expected to reach 3,305,000 barrels daily in 1953, compared with 3,146,000 daily in 1952, according to Charles J. Hedlund, director of the program division of the Petroleum Administration for Defense. Distillate demand, he said, will be about 1,460,000 barrels a day, against 1,318,000 last year.

"The enthusiastic response of our employees . . ."

ALDEN G. ROACH

President, Columbia-Geneva Steel Division and Consolidated Western Steel Division, United States Steel Corporation

"It is most gratifying to me that the employees of the Columbia-Geneva Steel Division and the Consolidated Western Steel Division of United States Steel Corporation have accorded meaning to their belief that the security of our nation rests upon our cooperative effort. The enthusiastic response of our employees made me doubly glad we conducted a person-to-person canvass for the Payroll Savings Plan for U. S. Defense Bonds."

The experience of Columbia-Geneva and Consolidated Western Divisions of United States Steel Corporation is not an isolated one.

Since January 1, 1951, hundreds and hundreds of companies have conducted person-to-person canvasses of their plants and offices. In every instance, employee participation in the Payroll Savings Plan has increased —sometimes from a low figure—to 60, 70, 80%. In a number of plants, participation passed the 90% mark.

The explanation is simple.

Employees *want* to provide for their future security.

Given an opportunity to enroll in the Payroll Savings Plan they respond immediately—as evidenced by the fact that more than 2,000,000 men and women have joined the Payroll Savings Plan since January 1, 1951.

The monthly take-home savings of the 7,500,000 now in the Payroll Savings Plan totals $150,000,000 per month—and growing rapidly.

As a step toward *your* personal security, and the security of your associates, bring this page to the attention of your top executive. Tell him that—

- a person-to-person canvass of your plant can be conducted without pressure, prize awards or other stimulation. (In many plants, employee organizations have undertaken the actual distribution of Payroll Savings Application Blanks.)
- The Savings Bond Division, U. S. Treasury Department, Suite 700, Washington Building, Washington, D. C., will gladly help your company with suggestions, posters, envelope stuffers and other aids.

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Field Development

Northern California Leasing Presages Expansive Drill Boom

All portions of Northern California evidently are being scanned for available acreage for oil and gas drilling by operators, but at the moment Glenn County appears the hottest spot in the scramble for ground.

The chief participants are reported Standard of California, Sunray Oil, General Petroleum and Ohio Oil.

Humble Oil is credited with acquiring land in substance near the town of Tudor in Sutter County. A wildcat well may be in prospect in that area on Sec. 25-13n-2e.

West of the town of Zamora and north of Dunnigan Hills, Standard has assembled a large block of leases.

A check on Northern California field operations disclosed Humble Oil was approaching the spudding stage with its Capital Co. No. 1 wildcat on Sec. 28-16n-1w, north of Colusa in Colusa County, following a period of idleness due to inclement weather.

Humble in the same area recently abandoned its Belle Fletcher No. 1 on Sec. 26-16n-1w, after bottoming at 7601 ft.

Tests conducted uphole showed a recovery of gas in several instances, but not at a commercial rate.

The company's John C. Maxwell No. 1 on Sec. 7-7n-3e at Dixon in Yolo County has reached 11,398 ft. and probably is about to bow out.

On Maine Prairie wildcat ground, Amerada Petroleum is ready to put down its Harris No. 1 on Sec. 16-6n-2e, Solano County. Hoyt Drilling Company is in charge.

Santa Clara County's Skyline area is being interrogated by The Texas Company's Hayward No. 1 on Sec. 5-8s-2w, which is yet to reach the critical stage.

Contractor Newton Drilling Company is digging at an inconclusive level with Western Gulf Oil Company's important test well on Sec. 2-22s-10e in the Pancho Rico Creek area, north of Monterey County's San Ardo field.

Completion of this test, either in a positive or negative position, will likely be followed by further wildcatting by the company. This next job on the agenda probably will be about six miles north of current Orradre well and located on Sec. 24-21s-10e.

It is a reasonable assumption that targets of the wildcats will be formations productive in the San Ardo field, which at present is accounting for 26,000 barrels of crude oil every day.

One and one-half miles west of the Montalvo field, Standard is boring below 1000 ft. with its State No. C-1 wildcat on Sec. 35-2n-23w, Ventura County. Location is near the booming surf, with drilling directionally.

The Eocene is destined to be the main objective of Union Oil's Torrey No. 92 test, making hole in the shallower formations on Sec. 5-3n-18w at Torrey Canyon in Ventura County. Drilling will endure to 15,000 ft. or more for a thorough test of the deeper formations in the area.

Location is about 800 ft. north of Torrey No. 83, completed as a deep zone discovery last April. It was finaled for 522 barrels of 19 gravity oil daily from the interval of 7662-9327 ft. This is a Loffland Brothers job.

The Texas Company's Hunter No. 1 on Sec. 6-3n-18w was last reported making progress with the drill at 8555 ft., with Pike Drilling guiding operations.

In the Guadalupe area along the ocean strand in San Luis Obispo County, Thornbury Drilling Company has evidently clicked with a new zone discovery through the medium of its LeRoy No. G-4 on Sec. 1-10n-36w.

Drilled to a total depth of 3287 ft., the well started off at the rate of 300 barrels of clean 10.5 gravity oil daily

Shell Oil Company's Casperson No. 13 in South Mountain Field with L. W. S. Drilling Company contracting the job. Left to right: Jerry Goldenberg, cathead; R. D. Harper, derrick; D. G. Jenkins, racker; O. L. Winton, driller.

from the interval of 2761 ft. and bottom.

The well was originally finaled late in 1952 in the Sisquoc formation from 3234 to 3287 ft. Yield was around 65 barrels of 12.5 gravity oil a day.

Completion of the well in a new zone in the Knoxville is a notable development in the history of the field as production tops anything heretofore uncorked there.

At Oakridge in Ventura County, Union Oil has given the final touches to three new wells in the field.

Oakridge No. 10-3 on Sec. 3-3n-18w was completed at 2950 ft. for an initial output on the pump of 154 barrels of 20.4 gravity oil in 13 hours, cutting 32 per cent. No. 14-3 on the section was finished at 2675 ft. for 138 barrels of 20.6 gravity oil in 20 hours, with an initial cut of 20 per cent. No. 11-3, which went originally to 10,781 ft. and then was redrilled to 2900 ft., on completion showed 546 barrels in 8 hours. This was gross rate.

The company currently has four additional wells working at various stages in the Oakridge area.

Results of Standard's deep trys at Santa Paula and in the Ventura Nose area is only a matter of days. Both the company's Thorpe No. 81-30 near Santa Paula, and Limoneira No. 1 on Sec. 23-3n-22w at Ventura Nose are in the neighborhood of 11,000 ft.

Successful development of oil in the lower formations of these drill sites would certainly cast new light on the territory involved and naturally bring about much new drilling.

Rocky Mountain Drilling Company is guiding the destiny of the Santa Paula wildcat. Hayes & Sprague are in charge of the Ventura Nose test.

Drilling continues at 3320 ft. in the Harry C. Long, Operator, Basolo No. 1-31 wildcat test on Sec. 31-4n-19w at Shiells Canyon. The work is in the hands of Dunlap & Graham.

North of Sulphur Mountain, G. Hamilton Beasley's Trane-Hood No. 1, a wildcat on Sec. 24-4n-22w, is making hole at 3140 ft. A Holmes Drilling Company contract rig is putting the Ventura County test down.

Across the line in Santa Barbara County, DeWitt Langford's Hollister No. 1 wildcat on Sec. 34-5n-33w at Gaviota is still idle at 1745 ft.

In the Elwood field, opened up on the Santa Barbara coast in 1928, Signal Oil & Gas Company's Honolulu-State No. 309-4 is redrilling at 9890 ft. The well the first time down went to 10,072 ft.

The Murphy Bros., Ltd., Murphy No. 3 on Sec. 34-8n-34w in the Lompoc field is temporarily inactive at 3558 ft.

At Santa Maria Valley, Sunray Oil's Bradley Lands No. 1-17 on Sec. 25-10n-34w is in from 5177 ft. for 338 barrels of 16.1 gravity crude oil daily, cutting 36 per cent. The company's Twitchell-Weging Comm. No. 5 on Sec. 35-10n-24w ran into a fishing job during redrilling operations at 1970 ft. Original bottom is 5550 ft.

Zaca Creek has given Tide Water Associated another good producing well. It is Luton No. 146 on Sec. 30-8n-31w, which is pumping 413 barrels of 20 gravity oil a day from 6474 ft. Quati No. 98 on Sec. 3-7n-31w is drilling at 3340 ft.

In the Bradley Canyon field, discovered 10 years ago, General Petroleum is ready to drill its Houk No. 52-9 on Sec. 9-9n-33w.

Eocene Developments Accentuate San Joaquin Valley Field Operations

The growing magnitude of Richfield Oil's deep discovery in the Wheeler Ridge area of Kern County is illustrated by the completion there of the company's third and fourth Eocene wells.

Richfield's fourth producer, KCL-D No. 16-28 on Sec. 28-11n-20w overcame a 46-day fishing job before its mechanical position was such to permit application of the final touches.

The well started off at the rate of 1334 barrels of 34.1 gravity oil and 1,800,000 cubic ft. of natural gas daily from a plugged depth of 10,285 ft. Flow was through an 18/64-in. orifice.

Perforations ranged from 9891 to 10,283 ft. in the 5-in. pipe landed at 10,283 ft., with 7-in. casing cemented at 9892 ft.

Location of the company's No. 16-28 is about 930 ft. southwest of the discovery well, which was completed last April 14.

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Richfield's third well to tap formation of Eocene age in the area was Gordon No. 14-28 on the section and one location northeast of the pool opener.

Initial yield was at the rate of 1048 barrels of 38.9 gravity oil a day under restrictions of an 19/64-in. choke. Interval tapped is from 9220 to 9632 ft.

Following the primary flow test the well was cut back to 386 barrels of 41 gravity oil and 1,450,000 cubic ft. of gas a day.

The allure of possible Eocene production in the Temblor Range area, six miles southwest of Taft has induced the company to embark upon new wildcatting in that part of the West Side.

Located on Sec. 31-32s-23e, the well is about to begin a drilling trip to 10,000 ft. or even more for new oil supplies.

No great distance southeast of the new wildcat effort, Richfield and Sun Oil Company figuratively clasped hands in days of yore to put down an unsuccessful test to between 6500 and 6600 ft.

Madera County's Chowchilla area is the setting for a brace of new test wells commencing under the banner of Tide Water Associated Oil Company, which the other week chalked up a sensational strike in eastern Saskatchewan through efforts of its Canadian division.

The Chowchilla jobs are Redman-Stone No. 1-7 on projected Sec. 7-10s-14e and Redman-Stone No. 1-20 on Sec. 20-10s14e.

Across the Madera County line on ground southeast of Camden in Fresno County, Steele Petroleum Company's Ormond No. 1 wildcat on Sec. 27-17s-20e is drilling steadily ahead at a relatively shallow level. It is aimed for the Eocene.

Steele's property around the drill site is framed by holdings of Pacific Western, Sunland Refining, Termo Associates, Standard of California and Signal Oil & Gas.

The last named, incidentally, has abandoned its Signal-Burrel No. 85-20 exploratory well on Sec. 20-16s-18e northwest of Burrel after drilling to 7207 ft.

Over in San Benito County near the town of the same name, Oceanic Oil Company has spudded and is drilling on down with its Rudolph No. 1 exploratory hole on Sec. 4-18s-9e. Brown Drilling Company is doing the work.

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In the vicinity of Hollister, Bailey Balken and A. D. Krug's Ferry-Morse No. 2 on Sec. 29-12s-5e has been completed at a depth approximating 2800 ft. and then shut in.

Some weeks ago, Ferry-Morse No. 1 on Sec. 20-12s-5e was finaled at 2470 ft. and shut in. Both wells are in the no dope classification and what may have been found of petroleum interest and power of the wells to produce is information known in detail only by the operators.

At Willow Creek, Edward Nepple has abandoned his Duke Empire No. 1 prospect job on Sec. 34-15s-7e at 5274 ft., but has started Bacon No. 1 test on Sec. 13-16s-7e.

Cuyama Valley has recorded two new abandoned test wells. C. W. Colgrove's Russell No. 22-4A on Sec. 4A-10n-26w pulled out at 8536 ft. and Russell No. 82-16A on Sec. 16A-11n-28w at 3135 ft.

Approximately 13 miles east of the South Cuyama field, General Petroleum Corporation's Clayton No. 14-4 prospect hole on Sec. 4-9n-24w continues to dig ahead below 2300 ft. The well is being put down by a General crew.

Superior Oil Company is about to spud its interesting Cuyama Government No. 2 wildcat well on Sec. 28-9n-26w in Cuyama Valley.

Back in Kern County in the sprawling Paloma field, Ohio Oil Company at last reports was probing persistently at 16,700 ft. with its thrilling deep test, following resumption of operations upon completion of a two-month fishing job.

The well, KCL-A No. 72-4 on Sec. 4-32s-26e, ran into mechanical troubles during drilling activity at 16,495 ft. It appeared that it was a practical impossibility to clear difficulties entirely, but the company obviously got by any fish.

One of the most interesting stories coming unofficially from the well is that the project picked up showings of oil below anything so far productive in the field.

Ohio's deep venture probably called for an outlay of around $1,000,000. Its ambitious schedule dictates

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that 20,000 or even may be 22,000 ft. of hole be drilled at this location.

At Lost Hills, Universal Consolidated Oil Company boasts two new producers from the W-3 zone.

No. 122X on Sec. 18-26s-21e was finished at 2998 ft. flowing 255 barrels of 30.9 gravity clean oil a day through a 10/64-in. bean. Hoover Drilling Company drilled the well.

No. 129 on the section came in from a redrilled depth of 3060 ft. for an initial output of 283 barrels a day of clean 31 gravity oil. The yield at last reports was 254 barrels daily.

Slightly less than a quarter mile southeast of Crown Drilling Company's Jeppi Camp No. 76-8 new pool discovery in the Edison area, General Petroleum is drilling below 800 ft. with its Graham No. 27-9 extension test on Sec. 9-30s-29e.

In the Buena Vista area, General's General American No. 33X-30 explorer on Sec. 30-31s-24e continues to drill ahead at 5710 ft.

Ten miles west and slightly north of Bakersfield in the Greeley area, Kern County Land Company for its own account has completed its KCY No. 42-19, an extension test on Sec. 19-29s-26e. Completion depth was 8389 ft. and primary output 145 barrels of 30.5 gravity oil a day, cutting 6.5 per cent.

Jumping over to the Poso Creek area, Intex Oil's Newhope No. 1 on Sec. 29-27s-27e has been completed at 2462 ft. for 200 barrels of 12.5 gravity oil a day from the Etchegoin sand topped at 2360 ft. Cut was 25 per cent.

On Sec. 11-27s-27e, Eureka Company is planning to put down its Newhope No. 4 on its 320-acre lease.

Tide Water Associated, which in recent months has been stepping up its drilling activities, has staked locations for seven new jobs in the Kern River field, a half-dozen miles north of Bakersfield.

Junctions No. 23, No. 24, No. 25 and No. 26 will drill on Sec. 9-29s-28e, Blinn No. 7 on Sec. 4-29s-28e, Tejon No. 36 on Sec. 36-28s-27e, and Queen Esther No. 7 on Sec. 31-28s-28e.

Rosedale has registered three consecutive failures seeking Vedder production with the abandonment of Humble Oil's KCL No. 16-14 deep test on Sec. 14-29s-26e. The project went to 10,530 ft. and quit when only gray Vedder sand was cored.

The field to date has only opened production in the Stevens zone.

Sunray Oil, which is busy in the Carrizo Plains and other areas in California, announces that its land acquisition and exploratory program is being projected on an aggressive basis for the current year.

The company also reported that its 1953 drilling program, depending upon availability of steel goods, will concentrate on a number of good wildcat prospects and the development of productive land established in 1951 and 1952.

Superior Oil is all set to pay a return visit to a number of wells abandoned in territory near the Bellevue field as a result of successful conclusion to its Berchtold No. 25-35 well on Sec. 35-29s-26e, which was given up years ago by other interests.

The new Berchtold well was finished at a plugged depth of 8569 ft. for a present yield of 85 barrels of 35.4 gravity oil and 40,000 cubic ft. of gas a day. A 7/64-in. choke is in use. Original bottom is 8800 ft.

In King County's Pyramid Hills, Brookline Oil Company has bottomed Brookline-Travma No. 1 wildcat on Sec. 8-24s-18e at 4012 ft. and is testing uphole by stages.

Considerable attention is being given W. W. Holmes' Cutter Unit No. 1 test on Sec. 29-23s-22e in the Alpaugh area.

Standard Oil originally took the test down to 3630 ft. and it was then acquired by Marshall Brown, who in turn let it go to the present operator. Redrilling, inaugurated at 2488 ft., has passed the 2650-ft. mark.

Newhall-Castaic Development Plans Chief Point of Los Angeles Basin

Between Newhall and Castaic and roughly two miles northwest of the first named community, a wildcat well is under way which holds the interest of several California operators.

General Exploration Company is acting as operator of the well, known as N. L. & F. No. 2 on Sec. 28-4n-16w. It is also on a 1570-acre lease block.

Drilling is scheduled to go as deep

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as 11,000 ft., with the first prospective zone anticipated at 6000 ft., plus or minus.

General is understood to hold a 25 per cent interest in the play, Basin Oil, 17½ per cent; Bolsa Chica Oil, 15 per cent; Christopher Oil, 12½ per cent; and C. G. Willis, 30 per cent.

A drilling industry concensus indicated optimism as regards the new drilling enterprise.

Some months ago, Superior Oil Company put down a wildcat test one-half mile south and a quarter-mile west of the General Exploration well. It was abandoned near 13,000 ft. A Pike Drilling Company contract rig is doing the work.

In the Castaic Hills, Standard Oil's Villa No. 45 test on Sec. 35-5n-17w is making hole steadily at 5030 ft. In addition to Standard, Paul Trousdale and Ted Sterling also share interest in the project.

The Texas Company's Newhall B No. 1 wildcat on Sec. 11-4n-17w in the Castaic Siding area is drilling several hundred feet below grass roots.

Jack Watkins' Thompson No. 1 on Sec. 12-3n-16w near Newhall has been written off at 2216 ft. The operator's Legion No. 1 on Sec. 1-3n-16w has been plugged back from a total depth of 3231 ft. to 3090 ft. and appears also headed for abandonment.

Land in the Del Valle area failed to give Harry S. Rothschild's Barbour No. 1 wildcat the expected production. Located on Sec. 16-4n-17w, the project was drilled and cored to 5753 ft. and then abandoned. Formation tests showed some gas.

All set to spud is Tide Water Associated Oil Company's Fernando No. 2 wildcat on Sec. 27-3n-16w in the Aliso Canyon area. In the near by Horse Meadows sector, Union Oil Company's Horse Meadows No. 1-46 test on Sec. 3-2n-16w is drilling at 3625 ft. with a Pioneer Drilling Company contract rig.

Approximately 1000 ft. south of production in the Rosecrans field, E. T. Wix is preparing to drill Simmons No. 1 on Sec. 20-3s-13w.

The well is on an 80-acre tract acquired from Atha Exploration Company, headed by George Atha, who is in charge of engineering on the new project.

Drilling is slated to persist to 8000 ft. or more for a test of both the seventh and eighth Callendar zones.

International Drilling Company is the contract driller of the well, located midway between San Pedro boulevard and Main Street and north of Olive avenue.

Southeast of the Oak Canyon field, Filmland Oil Company's Martino No. 1 wildcat venture at this writing was digging at 2880 ft.

The Los Angeles Harbor area was the source of interesting oil news.

Leading geologist Bill Geis, who during the past several months has been surveying the area, has presented a report to the Harbor Commission denoting the existence of petroleum under the city-owned 7000 acres south and east of the main channel.

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Successful development of oil beneath the great harbor of Los Angeles is foreseen as speeding up the 50-year harbor improvement project, estimated to cost $50,000,000.

The area studied apparently is separated by a fault from the Wilmington-Long Beach pool. It was pointed out that the half-century harbor plans entail the dredging of the West Basin and the removal of the drawbridge.

Down the south coast to beautiful Oceanside, Grober & Associates was digging on down at 1100 ft. with Perry No. 1 explorer on Sec. 33-12s-4w.

Near Victorville in San Bernardino County, Arthur B. Clark and C. E. Huntoon have temporarily suspended operations at 300 ft. with their Mutz No. 1 prospect job on Sec. 4-6n-5w.

In Orange County, Shell Oil Company is preparing to launch a new wildcat test called Wright No. 73-18 and located on Sec. 18-3s-8w at Santa Ana Canyon.

On the somber side of field events, Douglas Oil Company's Douglas-Newland No. 1 wildcat on Sec. 1-6s-

11w at West Newport was a production failure to 6050 ft. and relegated to history at that depth.

Denial at this time by the Office of Price Stabilization of approval for higher ceiling prices on crude oil and refined products was more or less of a surprise to Basin operators and oilmen elsewhere.

It was generally expected by the rank and file of the petroleum industry that the Federal Agency would look with favor upon an adjustment in prices in consideration of the increased costs associated with the producing and processing of crude oil.

Last November the Petroleum Administration for Defense recommended higher prices for West Coast petroleum and products as a means of boosting output to meet the growing military and civilian needs.

The OPS evidently is giving some thought to other methods of improving the present economic position of producers and refiners.

Under study are a direct subsidy by diversion of military purchases to areas other than California and some method of special price above the civilian level for products sold to the military.

At any rate, the California oil industry is confident that in the weeks ahead the new Administration will take steps to correct prevailing inequity of oil prices.

Extensive face lifting has endowed Richfield's office building at Sixth and Flower streets in Los Angeles with an ultra-modern appearance.

More than a year of work has replaced old decorative trim with up-to-the-minute terra cotta and black marble.

Additional office space has been provided and lighter, more comfortable work areas are provided. The employee coffee shop also was enlarged.

Stiles Clements was the architect for the job. Guy F. Atkinson was the contractor.

Atlas Oil Company and William R. Whittaker Company, Ltd's. No. 1 at Greenacres with Gibson Drilling Company, drilling contractor. Left to right: Floyd Ball, pipe racker; Dan Blair, derrick; Robert Simpson, back up; William King, rotary helper; George Mackey, tool pusher; T. H. "Slim" Hudson, driller.

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New Organization

Barcus-Colter & Associates of Wilmington is composed of several widely known oilmen, including Walter I. Barcus, C. O. Van Note, Jr., E. Ray Webb, R. I. Mahan and Paul Westerlund.

Anne Arnold & Associates of Los Angeles, who have been active in several California sectors in past years, have acquired 40,000 acres of prospective gas land in northern Utah's Cache Valley.

Ralph Arnold, geologist and engineer of San Marino, no relation to head of the operating organization, recently completed a study and reported on the area.

President Truman's decision to turn over to the Navy oil tidelands at Huntington Beach and elsewhere evoked a blast from Governor Earl Warren of California.

Said Warren:

"This reprisal is ill-advised, intemperate and represents confiscation so far as the State of California is concerned. I believe Congress and the new Administration will rectify the wrong done to it and to the other states similarly situated."

Last rites were held in Los Angeles for Stuart A. Ratliff, research and freelance writer who died in Rome, Italy. The son of Sidney Ratliff, Ring Oil Company official, his body was flown back by air. The younger Ratliff was born in Los Angeles, February 25, 1917. He had planned to study for the priesthood and had entered St. John's Seminary, Camarillo, in 1941. The next year, however, he was forced to give up his studies because of illness. He was an invalid from 1942 to 1948, but in 1951 was able to go to Rome.

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With Drilling Contractors

California Contract Drillers Foresee Busy And Active Year

California drilling contractors reasonably anticipate the year current to be active and prosperous.

The state continues to run short of petroleum to meet growing consumptive demand and about 50 per cent more wells necessarily must be put down to reach a tentative goal of 3190 wells.

If enough oil country tubular goods are made available to drill this number of wells, the Oil Producers Agency said shortages of oil production in California can be overcome.

All contractors are fully aware that drilling in the state during recent years has been heaviest in proved and semi-proved areas rather than in wildcat territory and the development of new oil.

A good share of the blame for lagging exploratory drilling is naturally the fault of unrealistic oil prices. Operators certainly have little disposition to drill wildcats, with all their related hazards and expense, while ceilings on crude oil prices remain static.

For a time at least oil price decontrol appears to have been delayed by the Office of Price Stabilization even though late in 1952 the Petroleum Administration for Defense recommended price adjustment as a means of stimulating much needed new drilling in California.

Oil price control was the subject of conversation Interior Secretary Chapman recently had with a group of oil producers in Washington.

Mr. Chapman emphasized that such decontrol would not have an inflationary effect on the nation's economy.

The Secretary's statement was unlike a position taken by OPS Chief Freehill, who declared petroleum prices probably would rise several hundred millions of dollars, if controls were discarded.

It was Mr. Chapman's considerate belief that decontrol would only result in local competitive adjustments. However, he refused to ask the OPS to remove controls on oil stating that price recommendations are not the duty of his department.

Many Washington observers expect price ceilings to be kept in force until the law expires next April 30 and then allowed to lapse. They pointed out, however, that the new Administration at that time probably will request standby powers on price-wage ceilings in some directions.

The 3190 wells would use 223,300 tons of steel or a quarterly average of 55,825 tons.

Confidence is apparent in the California drilling branch and all other segments of the petroleum industry that the Federal Government will move in the next month or two ahead to correct oil prices in this state.

New Drillers

C. F. Johnson is the head of Fred Johnson Drilling Company of Long Beach, a new and enterprising member of the contract drilling business. Other firm members include R. J. Osburn, T. M. Shallenberger and K. R. Davis.

Prominent oilmen Frank Cardin, H. D. Guerin and Robert C. Tipton are owners of the Anthonian Drilling Company, Bakersfield.

Crown Drilling Company, which the other week scored with an important new oil discovery in its own right at Edison has given the final touch to its contract job for Gus Pongratz at Race Track Hill. The well was completed at 4810 ft. for a yield yet to be evaluated accurately.

Miller & York has completed Humble Oil's A. B. Renfro No. 2 well on Sec. 23-29s-26e in the Rosedale field for an initial yield of 70 barrels of net 27 gravity oil through a 10/64-in. choke. Total bottom is 5925 ft.

In Santa Barbara County's Santa Maria field, an Argo Drilling Company contract rig has brought to successful conclusion Union Oil Company's Bradley Lands No. 1-17 on Sec. 25-10n-34w. The well started off pumping at the rate of 354 barrels of net gravity oil a day from 5177 ft.

At the Honor Rancho field in Los Angeles County, Rocky Mountain Drilling Company under contract with The Texas Company has chalked up an excellent new producer. It is NCT-One No. 15 on Sec. 6-4n-16w, which at last reports was flowing at the rate of 822 barrels of 36.2 gravity oil a day, along with 705,000 cubic ft. of natural gas. Interval open to production is 6285-6433 ft., with total bottom of the well 7932 ft. and plugged depth 6600 ft.

Newton Drilling Company is doing the work on Brookline Oil's Travma No. 1 wildcat on Sec. 8-24s-18e in the Pyramid Hills area of Kings County. Casing has been run and test is in progress at this writing. Engineering is in charge of Don Cook.

Castaic Drilling Company at Newhall has several widely known persons as directors. They are R. L. and Joyce L. Brewer of Santa Paula, and J. D. Hooper of La Habra.

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Chiksan Expands Brea Plant

Expansion of the Chiksan Company plant in Brea, California is under way to increase office area and warehouse and assembly facilities, it has been announced by H. J. Hagn, President.

A large, modern building will be constructed adjacent to the present main office building. The new structure will have 28,000 square feet of working area and will consist of a finished material warehouse and assembly section, with an office area to accommodate the Purchasing, Personnel, Cost Accounting, Price Estimating, Production and Material Control, and Sales Development Departments. Included will be a large sales conference room which will also serve as a display room for plant visitors.

Existing office and warehouse facilities on the building site are now being removed preparatory to construction of the new building. It is expected that the expansion will be completed by July of this year.

The new structure will incorporate the latest features of architectural design. The most modern sprinkler and fire protection system will be used throughout.

New equipment will be used in the warehouse section for rapid handling and storing of Chiksan ball-bearing swivel joints, all-metal hose, and other products. Installed in the Assembly Department will be the most modern equipment for cleaning, processing, and assembling material.

Completion of the new building will increase the efficiency of plant operations and improve customer service, according to plant officials.

Mr. Ralph S. McLean, structural engineer of Fullerton, California, is handling details of the construction. The architect is Everett Lynn Child of Fullerton.

The addition to the Brea Plant is the latest step in the steady expansion program under way at Chiksan Company. Production area was increased and additional machinery installed at the Brea plant last year. Similar expansion took place at the Houston plant of Well Equipment Mfg. Corp., a division of Chiksan. The Company recently announced that property had been purchased in Brantford, Ontario, Canada to be used as a site for a new manufacturing plant. The new Canadian subsidiary will operate under the name of Chiksan of Canada, Ltd.

Architect's conception of new Chiksan Company building in Brea, Calif.

Petreco Expands Research Laboratory Facilities

The Petreco Division of the Petrolite Corporation recently has completed an addition to their research facilities at the Webster Groves, Missouri, laboratories. The new addition includes approximately 4500 square feet of floor space, in a new, two-story reinforced concrete and brick structure. In the new Petreco laboratories at Webster Groves are facilities for the fundamental investigation of electric fields and for the study of the chemical phases of the various electric treating processes developed by Petreco, as well as an extensive pilot laboratory, where the various applications of electric processing are studied and developed in small-scale equipment. Supplementary facilities such as photographic equipment and dark room, fire-proof storage for hazardous liquids, maintenance shops, store-rooms and office space also have been provided.

These additions to the laboratory facilities were necessitated by the extensive studies now being carried on by Petreco in the field of electric petroleum processing. These activities, now in full swing at Webster Groves, are supplemented by specialized activities at the Petreco district laboratories in Houston, Texas and Long Beach, California, and have been further extended in pilot plant activities in refineries. The electric petroleum refining processes now being studied by the Petreco research and development staff include acid and alkali treating of lubricating and lighter distillate fractions, removal of salts and other impurities from crude oils, dehydrating of emulsified crude oils, sweetening of distillates, and improvement of stocks charged to catalytic cracking units. In addition to these studies, a continuing development program is under way toward the improvement of electric treating equipment and methods.

When Petreco pioneered electric desalting, a research and development program for refining problems was begun. It has been kept active on an increasing scale ever since. This program has enabled Petreco to amass a large volume of electric treating data that has frequently been helpful to the industry. The Petreco research and development staff welcomes any opportunity to assist refiners on problems involving the removal of impurities from oil, the correction of emulsion difficulties, and associated problems.

Another U.O.P. Unit To Be Built

Aurora Gasoline Company, Detroit, will install a second UOP Platforming unit, this one to be built at its Elsie, Michigan refinery. Aurora has been operating a Platformer at its Detroit refinery since September, 1951. The Platforming process was discovered by Universal Oil Products Company and is being licensed to the refining industry by that company.

(Continued from page 19)

Wondra's No. 1 Alley. Results were not definite at this writing. The area is in the Denver-Julesburg Basin.

New Mexico

Phillips Petroleum found salt water in the Mississippian at its No. 1 Navajo in the Chimney Rock area. Operator plugged back for further tests. The well was drilled to a total depth of 8175 feet. It is located in n½ se se 5-30n-17w, in San Juan County. The same operator was planning further tests of the No. 32-7 Mesa Unit, ne se sw 8-31n-7w, in eastern San Juan County, after recovering gas in the Mesa Verde.

Western Canada

Merrill-Mitmor and Associates were preparing to run production tests at their No. 5-1 in the Erskine area. Tests will be made of the D3, where oil and wet gas have both been found. Operator previously recovered both gas and oil in the Lower Cretaceous. The D3 was topped at 5327 feet and perforations were made at 5377-85 feet for the scheduled tests.

Gulf C.P.R. Ewing No. 14 was drilling ahead below 5550 feet and has found oil in what it believed to be the D3. Gas and oil were recovered in drill stem tests of the interval 5514-22 feet. The well, drilled by Canadian Gulf, is located in 1sd 14 of 23-37-21w4.

Pacific Petroleums has announced an extensive drilling program in British Columbia. Pacific Petroleums and Peace River Natural Gas Co. have entered into drilling agreements with a number of other companies for development of the Sunrise area in the Northeastern part of the province. Pacific also has undertaken a program in the Rycroft area of the Peace River country.

In the Canadian portion of the Williston Basin, Tide Water Associated was coring ahead at the No. 1 Forget-Crown after finding oil at the rate of 150 barrels per hour on drill stem test of the Upper Mississippian. The well is in 2-11-9n-7w2, in central Saskatchewan and 50 miles north of Divide County, N.D.

Oil Order Vexes Republican Solons

Most Republican Congressmen were annoyed and angered by President Truman's order in the last days of his Administration setting aside tidal oil lands for Navy use. Several members of Congress have predicted that the order will be quickly overturned by the new President or by action of Congress.

No less than 40 Senators already have introduced a bill to give to the States control of the lands under marginal seas. President Eisenhower also has said he favors doing so, a stand which may have helped him carry Texas, which is one of the States primarily affected. California and Louisiana are the others.

California's Deepest Producer

In three short years fame has passed by Standard Oil Company of California's Mushrush No. 5, leaving the deep well near Wasco all but forgotten.

When Standard completed the Mushrush well in September, 1949, it was the deepest producing well in the world and as such was widely publicized. A deeper producing well since has been completed in Louisiana, and Standard's well, though still the deepest producer in California, has faded into obscurity.

Today Standard's well is still flowing as completed. Production from intervals in the overall interval of 15,250-15,530 feet in the Eocene zone has not posed any particular problems.

A review of the well's history for the past three years indicates that about the only problem has been one of decreasing production — a problem that is shared by many other wells, both deep and shallow ones.

Originally Standard drilled the Mushrush well in the spring and summer of 1940 as a development well for the Vedder sand. Eight years' production exhausted the Vedder and in February, 1949, Standard moved in a powerful steam rig to deepen to the Eocene.

Seven months later the well was completed flowing 375 barrels a day of 40.1-gravity oil. Completion marked up a new deep production record.

Economically, the deep well has yet to prove of any great merit. Cumulative production to date has been approximately 165,000 barrels of high gravity oil. Shallower wells in the Belgian Anticline field near McKittrick have produced more than twice as much oil in a year's time.

Present production at Mushrush No. 5 is 98 barrels a day net of 43.4-gravity oil, cutting three per cent. Tubing pressure is 72 pounds. Standard's well is making about 412,000 cubic feet of gas per day.

Since completion of the Mushrush No. 5, one other well on the same lease has been deepened to the Eocene zone and it was abandoned as a dry hole. At the present time, there is no indication that any further development of the Eocene zone is anticipated for the declining Wasco field.

Bishop Oil Company Organizes Subsidiary

Bishop Oil Company of San Francisco has brought to a finish organization and registration of its subsidiary, Canadian Bishop Oil, Ltd. The subsidiary is preparing to embark upon an active program of land acquisition in Alberta, Saskatchewan and British Columbia from its headquarters in Alberta.

Canadian Bishop already controls a lease interest in some 18,000 acres in Saskatchewan on which a well is being put down in partnership with Imperial Oil, Ltd.

The four entirely-owned wells of Canadian Bishop in Alberta's Redwater field still are producing at the full allowable combined rate of 245 barrels a day.

In the Cessford area of Alberta the company has 2540 acres of leases no great distance from the recently completed Amurex wells.

I. S. Kyser of Sandercock Transportation Company has been installed as president of the Motor Truck Association of California's Kern County unit at ceremonies held at the Bakersfield Country Club. He succeeded H. E. Phoenix, Oilfields Trucking Company official, who served as president of the unit during the past two years.

Union Oil's President Reese H. Taylor has purchased a beautiful new home on Shenandoah road in San Marino and he plans to move from his Huntington Hotel abode next May.

THIS

LAUGH OFF!!

He: "Pardon me, but you look like Helen Black."

She: "So what? I look worse in pink."

Customer: "Say you know that cheese you sold me yesterday?"

Grocer: "Yes, sir."

Customer: "What did you say it was imported or deported?"

Dear Dorothy:

"I am only eighteen years old and stayed out until 2 a.m. the other night. My mother objects. Did I do wrong?"

Answer: "For goodness' sake, girl, try to remember!"

The life insurance applicant, having been examined by the company physician at some length, asked, "Well, doc, how do I stand?"

"Goodness knows," answered the medico. "It's a miracle."

Policeman to pedestrian just struck by hit-and-run driver: "Did you get his license number?"

Victim: "No, but I would know his laugh anywhere."

We hear a bank examiner, somewhere in Australia, walked into a bank. There were no clerks, tellers, cashiers. Finally he looked out the back door—there in the shade of a tree sat the four playing poker. To give them a lesson, he tripped the burglar alarm. They never moved but the bartender across the street came over with four beers.

Sam: "That was some mess at Bill's house last night. Bill came home unexpectedly, found Elmer with his wife, shot and killed Elmer, then was shot and killed by his wife."

Jack: "It could have been worse."

Sam: "How could it have been worse?"

Jack: "I was there the night before."

The group was going through an ancient castle in Scotland.

"This castle," the guide told them, "has stood for 700 years. Not a stone has been touched, nothing altered, nothing replaced."

"Hm!" observed one woman. "They must have the same landlord we have."

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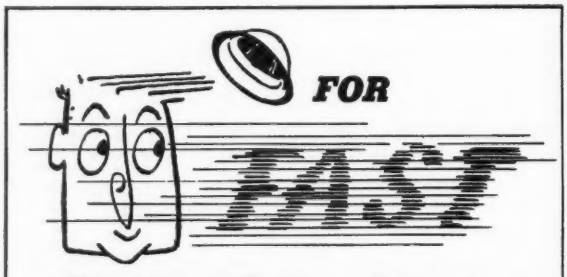

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